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Scorpion, Scimitar, and Sabre

John Prigent



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By John Prigent

The two main doctrines of reconnaissance are stealth and strength — either move inconspicuously to get your information and pass it back without the enemy knowing your presence, or fight for your information and pass it back without worrying that the enemy knows exactly where you are and may choose to deceive you by faked troop movements or other tricks. The stealthy approach has been British doctrine for many years, using small, quiet vehicles which are easy to conceal and hard for an enemy to hit if detected.

Many other armies have almost entirely abandoned stealth, preferring to use heavily armed vehicles which can if necessary defeat enemy tanks and accepting that this means that detection is far more likely. Crew opinions do not seem to have been sought in this decision.

Scimitar is probably the best-known part of what is actually a family of vehicles, collectively known as CVR(T) — Combat Vehicle Reconnaissance (Tracked). It is the close reconnaissance member of the family, which also includes the Scorpion medium recon vehicle, the new Sabre conversion of Scorpion, and missile launcher, personnel carrier, recovery, command, and ambulance variants. For reasons of space only Scimitar, Scorpion, and Sabre are covered in this book.

The origins of CVR(T) began in 1961 when studies started for a replacement for the Saladin gun-armed 6x6 armored cars then in service. The requirement was for an air-portable vehicle able to give fire support and also with an anti-armor weapon. Initial studies produced a design with a 76mm gun in a turret plus Swingfire anti-tank missiles in a rear-mounted launcher, but the resulting weight was above limits for air transport. Studies

continued, and in 1965 the design of the future vehicle began to emerge.

Maximum combat weight was fixed at 7.9 tons to allow two vehicles to be carried in the C-130 Hercules, ready for action on landing. Quietness was a primary concern, swimming capability was required, and ground pressure was to be kept to that of a marching soldier at about 0.35 kg per sq cm. Width was fixed at 2.1 meters since this was Hercules' maximum allowable load width, and the iron ratio of width to length for effective steering determined the vehicle's length while height was to be as low as possible to aid concealment.

Aluminum armor is used, giving not only lower weight but also higher structural stability than steel armor of the equivalent protection. To save further weight there was no powered traverse and elevation gear, all gunlaying being manual and reported as hard work when the vehicle was on a slope.

The armor is proofed against 12.7mm on the frontal arc and 7.62mm rounds elsewhere, and all around protection against shell fragments from bursts. This relatively light protection reflects the British Army's reconnaissance doctrine: recon vehicles must not attempt to fight enemy armor or anti-tank weapons, using their weapons instead to cover a swift withdrawal since the information brought back is of far higher value than a few knocked-out enemy tanks.

Both Scimitar and Scorpion carry an image intensifying sight for the gunner. Its square housing forms part of the gun mantlet, to starboard of the main armament. The commander has a spotting telescope on top of his main periscope when the vehicle is in an observation position. Details remain secret but this is believed to

be an image intensifying scope.

The Jaguar J60 4.2 liter gasoline engine was selected as being the only available one which would give the required power while fitting such a narrow chassis. Its compression ratio was reduced to accommodate low-octane fuel but the power-to-weight ratio was good enough to give CVR(T) startling acceleration and high mobility.

In 1967 Alvis Ltd was awarded contracts to build prototypes, and after extensive trials the first production contracts were placed with Alvis. Total production up to 1996 is believed to be in excess of 3,500 vehicles of the whole CVR(T) family, nearly 1,900 of which were for British forces with the balance being export orders including many built in Belgium for that country's Army.

The first vehicles into service were actually Scorpions, with first deliveries in January 1972. Scorpion was intended as the fire support variant and mounted a 76mm gun, derived from that fitted to the Saladin which Scorpion replaced, as well as a co-axial 7.62mm GPMG (General Pur-

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Acknowledgements

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FRONT COVER This Scimitar of 9/12 Lancers shows the bolted deck without its mesh screens as well as the original five inch headlamps. Also visible on close inspection of this early vehicle are the bolt holes where the swimming screen was removed from the trackguards and platform, and Scimitar's simple gun travel lock with a flat hinged top.

BACK COVER

TOP, although upgraded with the later fittings, this Scimitar of the 1st Royal Tank Regiment retains the original bolted radiator hatch.

BOTTOM, this Sabre exhibited in UN white shows the hinged radiator hatch, with its louvres reversed in direction and mounted in a raised surround. This hatch was fitted to both Scorpion and Scimitar but seems fairly rare as it was not refitted to existing vehicles when it was introduced.



pose Machine Gun, known to the troops as "Jimmy"). 76mm ammunition types included HESH, HE, smoke, and canister, and forty were carried together with 3,000 rounds for the GPMG.

The second type into service was Scimitar, the close reconnaissance version of CVR(T). Scimitar is almost indistinguishable from Scorpion at any distance, differing only in mounting a 30mm Rarden gun in a revised mantlet. This weapon is by no means lacking in the anti-tank role, and reports indicate that at least one T-55 type tank was knocked out by a Scimitar

during the Gulf War.

Sabre, the newest version, is a conversion of Scorpion. In 1993 a decision was made to withdraw Scorpion from service because toxic fumes entered the turret when the 76mm gun was fired, though if these really represented any significant hazard it's hard to imagine that no danger existed in the previous twenty years' service. Whatever the reason, many Scorpions hulls were in perfectly serviceable condition so it was decided to mount the 30mm Rarden-equipped turrets from Fox armored cars on them. (Fox, the armored

car equivalent of Scimitar, was withdrawn from service at the same time). Differing turret ring sizes meant that an adaptor ring had to be used to mate the two together.

During the long production run there have been a number of changes to both Scimitar and Scorpion. Many have been retrofitted to early vehicles to improve them but some seem to apply only to new vehicles or major rebuilds, so vehicles with the earlier configuration could still be seen in 1996.

The most obvious change was the removal of the swimming screen in 1980, when the requirement for a swimming capability was dropped. The screen had been carried under a light metal housing which ran all the way round the hull on top of the trackguards, and was the reason why they were flat and extended into a platform across the front and rear of the hull. The platform, however, was kept since its front and rear extensions helped to stiffen up the trackguard sections, and the front one was the mounting point for the headlamps.

One consequence of the screen's disappearance was that the headlamps, originally mounted below the platform, were sometimes moved to its top. A noticeable change to the headlamps themselves was the replacement in June 1987 of the original five-inch type, carried under the platform, with larger nine-inch ones on top of it and with shrouds fitted round them. Various configurations can be found in photographs including the fitting of small lamps on top of the platform, or of

ABOVE and RIGHT: A walk around the Scorpion shows that the only noticeable difference from the Scimitar at a distance is its shorter, fatter barrel.



large ones under it with or without the shrouds on top of it.

Other changes visible in photographs are that from three-cup smoke mortars to four-cup ones, the replacement of the original turret rear bin with a wider one and the fitting of large turret-side stowage bins. Less conspicuous alterations were the introduction of new sprockets and idlers, in both cases replacing plain dished versions with spoked wheels. Changes not often noted at all also took place: the original bolted radiator hatch was changed to a hinged one and the direction of its louvres reversed, and a heavy-duty tow pintle on a strongback was fitted to the rear hull in place of the simple original pintle.

Modelers, and those simply wishing to fit an undated photograph into its time frame, will find a knowledge of these changes useful. The following table giving the dates of their introduction in chronological order should help. Note that the absence of a feature may only mean that the vehicle had not been retrofitted with it, as many in 1996 still retain their original radiator hatches and some still have the early idlers and/or sprockets.

- Jul 1973: hinged radiator hatch replaced bolted hatch, direction of louvres reversed.
- Sep 1972: 3-cup smoke mortars changed to 4-cup type.
- Jul 1975: spoked sprockets replaced plain dished pattern.
- 1975: improved rear towing pintle on strongback.
- Oct 1979: addition of large turret-side bins.
- Jan 1980: swimming screen removed.
- 1982: spoked idlers replaced plain dished pattern.
- 1986: wider turret-rear bin, rear half of top sloping instead of whole top being flat.
- Jun 1987: fitting of new larger headlamps with shrouds.
- 1996: improved, larger fire extinguishers fitted to turret on modified brackets.

Scorpion and Scimitar were both used during the Falklands War of 1982 as well as in the 1991 Gulf War. Scimitar and the new Sabre have both been used by the Bosnian peacekeeping force.

The standard color scheme for CVR(T)s, since their entry into service, has been British exterior green with black overstriping. The edges of the black can be either hard or soft and patterns vary considerably. The green varies in tone on first



This Sabre exhibited in United Nations white shows the hinged radiator hatch, with its louvres reversed in direction and mounted in a raised surround. This hatch was fitted to both Scorpion and Scimitar but seems fairly rare as it was not refitted to existing vehicles when it was introduced.

application and then fades, so is hard to compare with FS 595A. [Suitable matches for modelers are Xtracolor X811 Russian WWII tank green and Humbrol 179 French artillery green, but the color can range from these to Humbrol 155 Olive Drab.]

CVR(T)s serving in UN markings in Bosnia were painted white, but those now with IFOR are in the green-and-black scheme as were those in the Falklands War. Gulf War vehicles were finished in Light Stone, very close to FS595A 20475 or a darker version of 23619, and weathered to 33578. [Suitable paint matches for 20475 are Xtracolor X813 British light stone or Humbrol 121 matt pale stone, and the weathered color is matched closely by Humbrol 71 satin oak overcoated with matt varnish.]

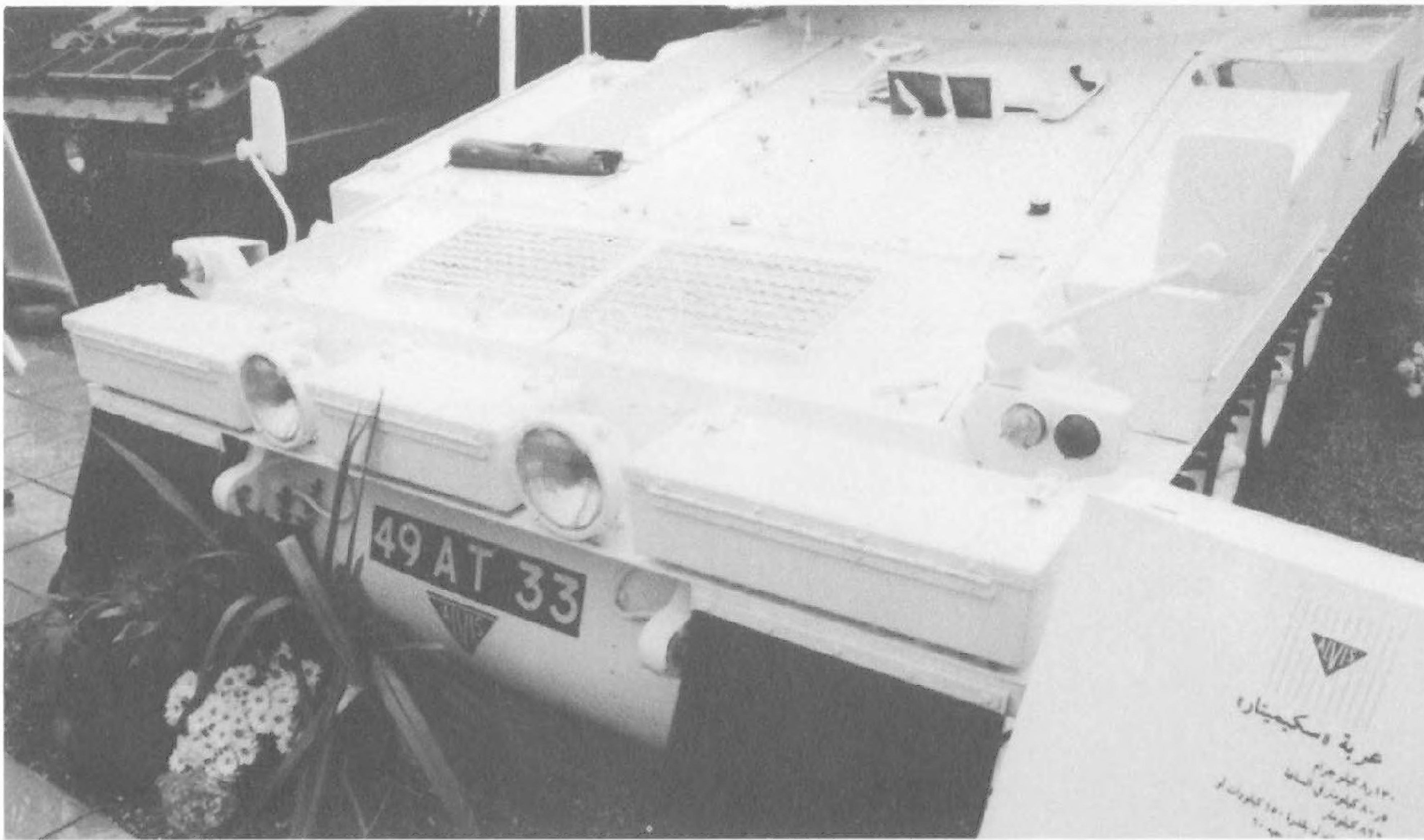
British vehicle serial numbers are white on a black rectangle. Callsigns are yellow on the green-and-black finish or black on either white or light stone; some vehicles also carry small black callsigns on a white patch on the lower hull rear. Interior paintwork is mainly matt silver and

exterior green, with buff or silver-gray spall liners.

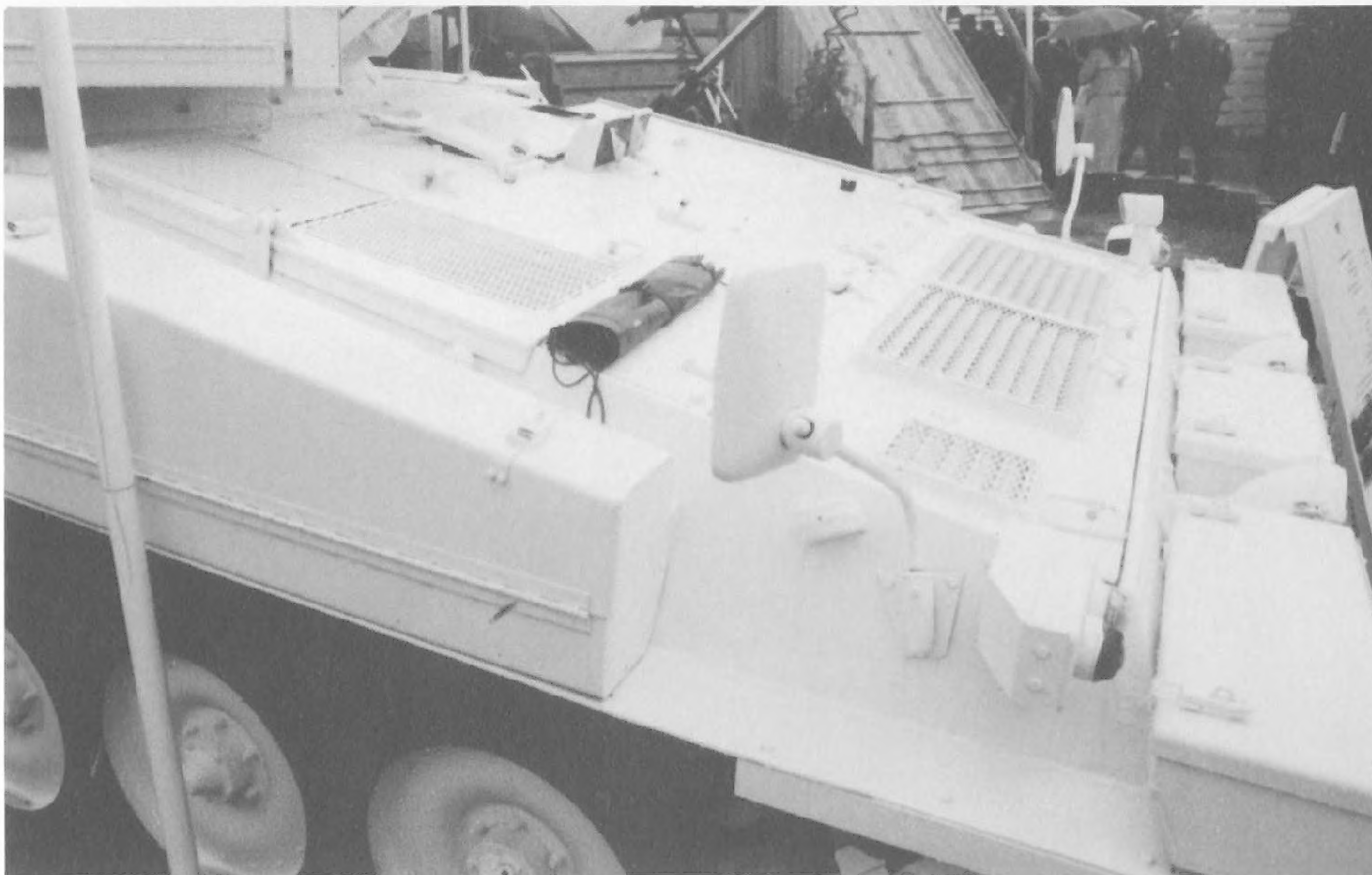
COMPARISONS

The accompanying table compares the reconnaissance versions of British, US and Soviet-built vehicles. Hummer has been included since its armed versions can be used for reconnaissance. The table figures are drawn from a variety of sources so may not be entirely reliable, but they do show the overall superiority of the Scimitar series for stealthy reconnaissance. It is smaller, hence less conspicuous and a harder target if detected than any of its competitors, and longer-ranged than any except the BRDM-2. The BRDM-2 is also faster on roads but probably slower across country, and being wheeled has a higher ground pressure which makes it much less able to cope with soft ground. It is also noticeably larger, reducing its utility for reconnaissance by stealth, and like Hummer is far more vulnerable due to its light armor.

	SCIMITAR	BFV	HUMMER	BRM	BRDM-2
Crew	3	3+2	2+2	4+2	4
Weight (metric tons)	7.9	30	3.6	14.5	7.0
Length (m)	4.4	6.5	4.6	6.8	5.8
Height (m)	2.1	3.0	2.4	2.1	2.3
Width (m)	2.1	3.3	2.2	2.9	2.4
Road Speed (kph)	80+	61	70+	80	95
Range (km)	600+	400	500+	500+	750



ABOVE: The Sabre has a new type of mount for the front sidelights. Not shown, but the taillamps remain as fitted to Scimitar and Scorpion.



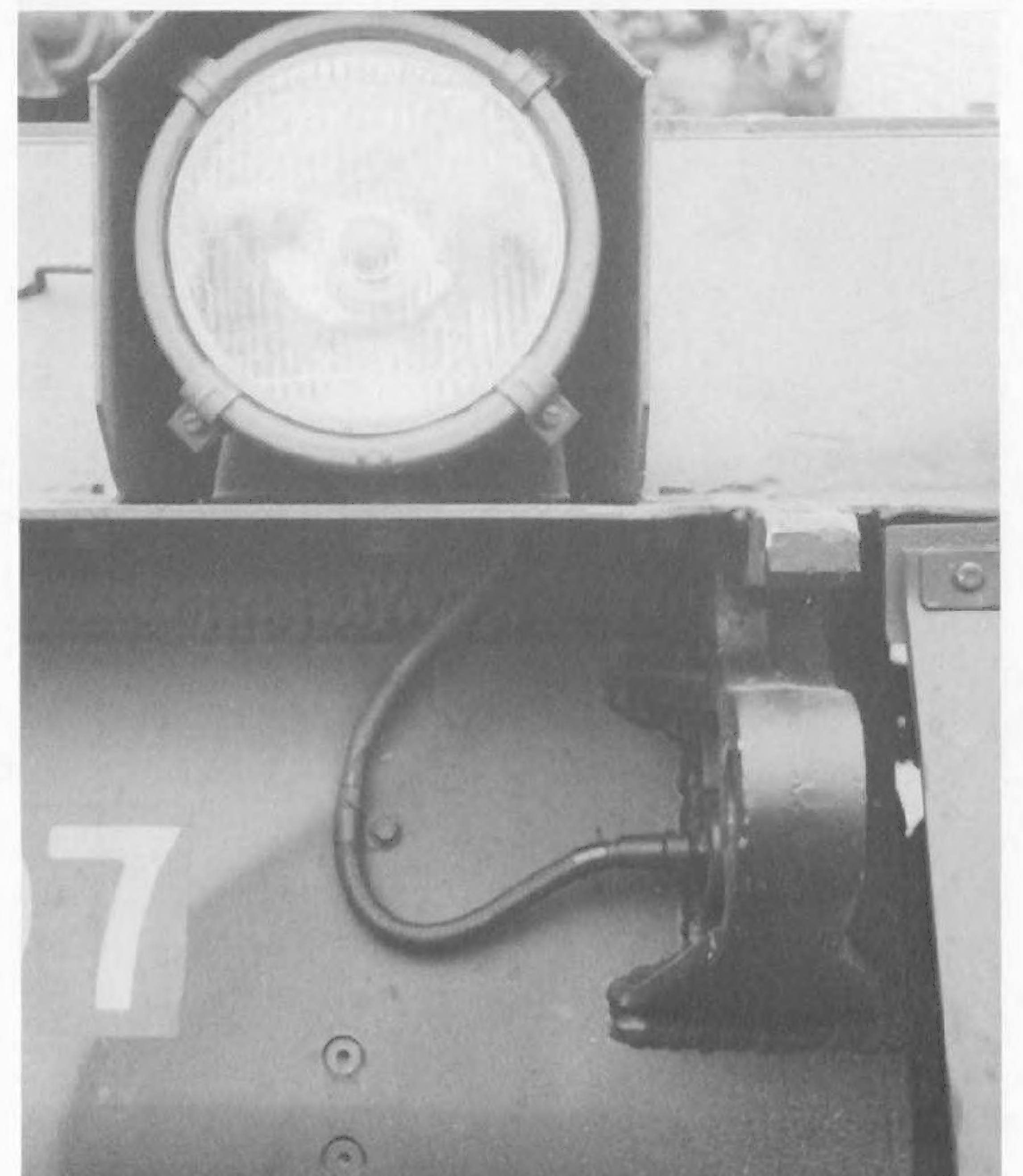
TOP LEFT: this close view of the hinged radiator hatch also shows the layout of Sabre's new hull-front stowage bins. No headlamp shrouds are fitted to this example.

MIDDLE LEFT: Another view of the hinged radiator hatch.

BELOW: The lamp wiring leads under the platform into the back of the towing bracket.

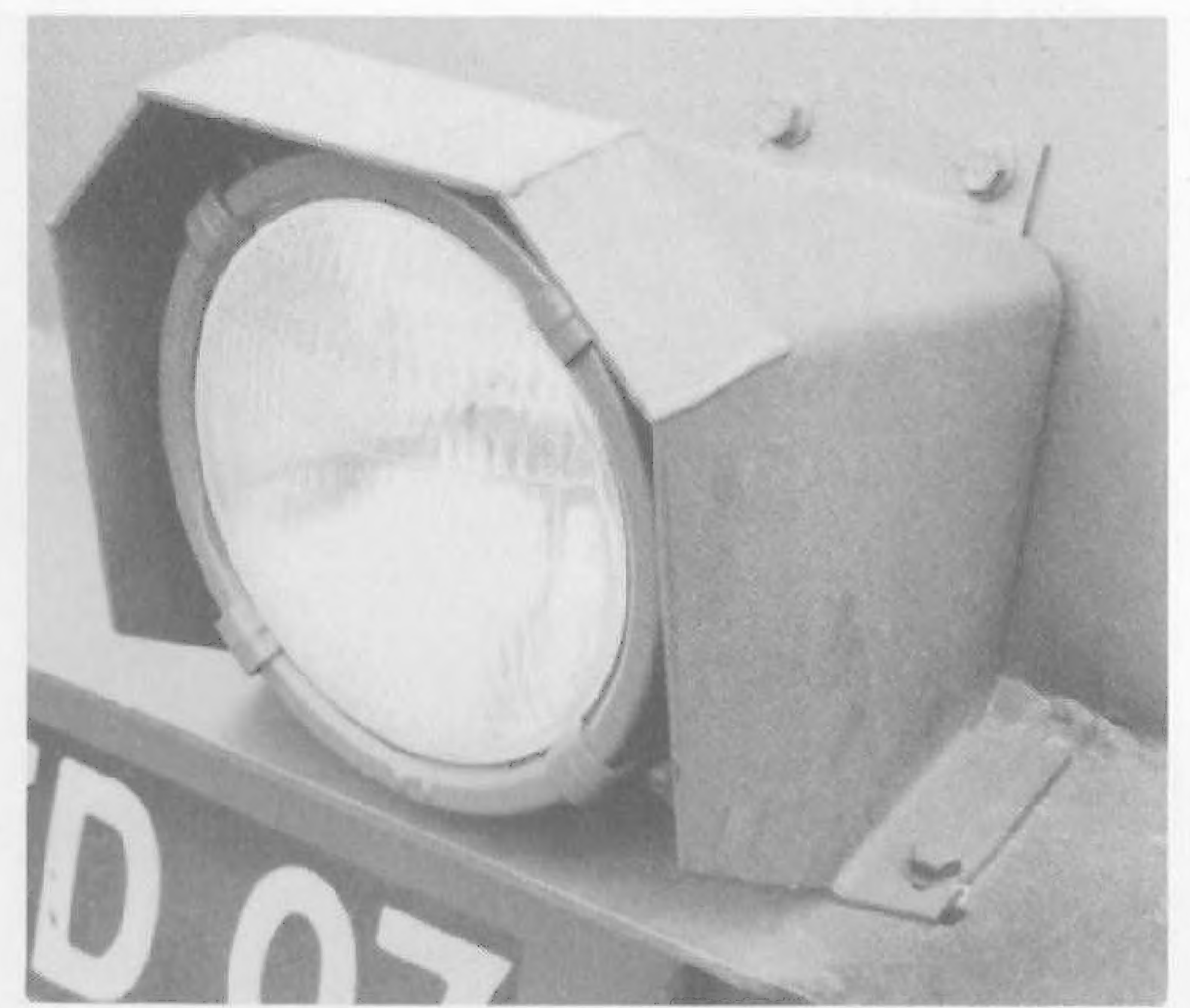


LEFT: Warning lights are carried in a housing on the port side where the driver can see them. The lights are: top- red, gearbox oil pressure; port-amber, engine oil pressure; starboard-green, dual-purpose for coolant or generator fault warning.





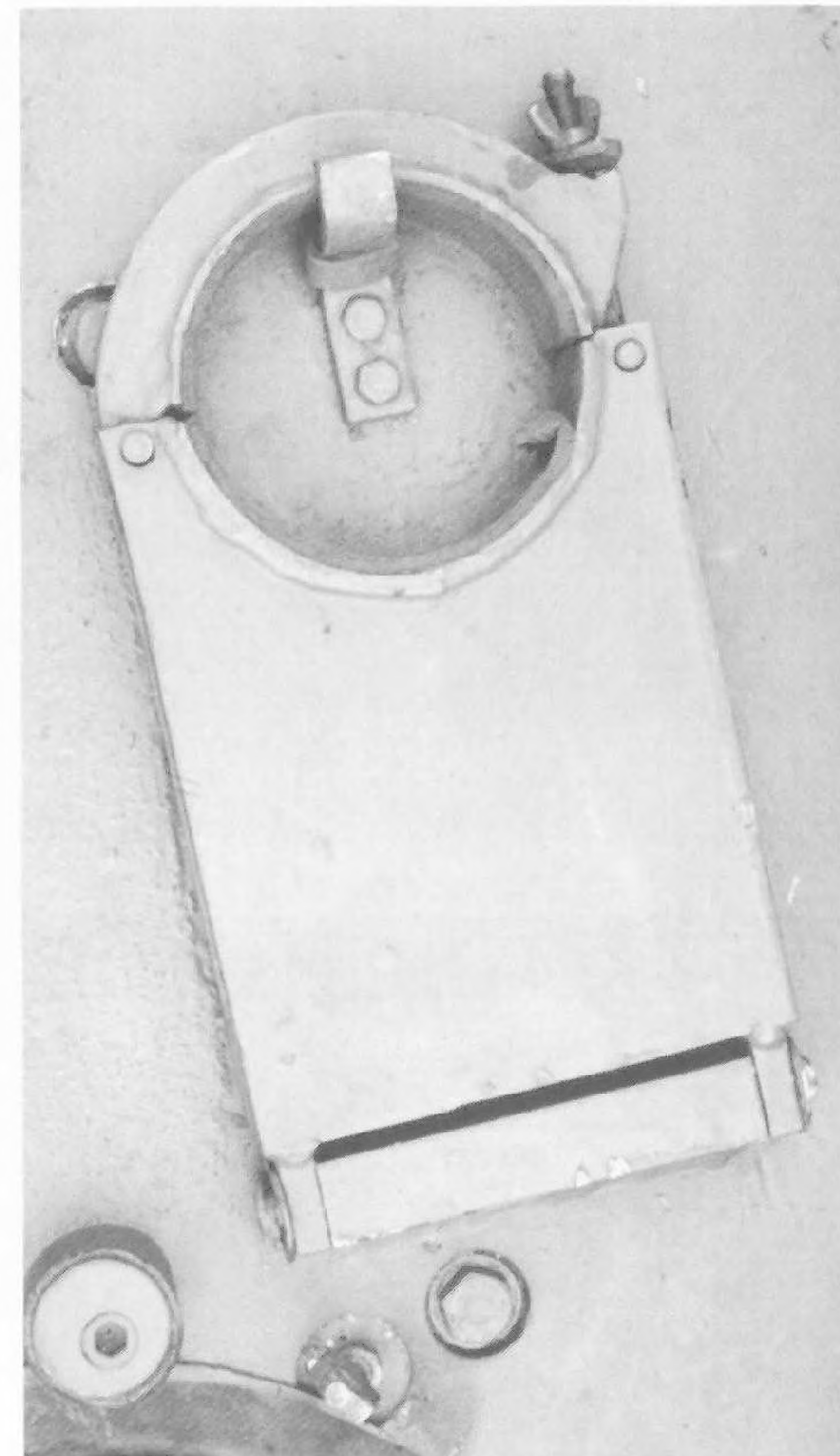
ABOVE: Here is a view of Sabre's front hull bins which also shows that an "old-style" Scorpion hull was used, retaining its early bolted radiator hatch. This vehicle has been equipped with headlamp shrouds.



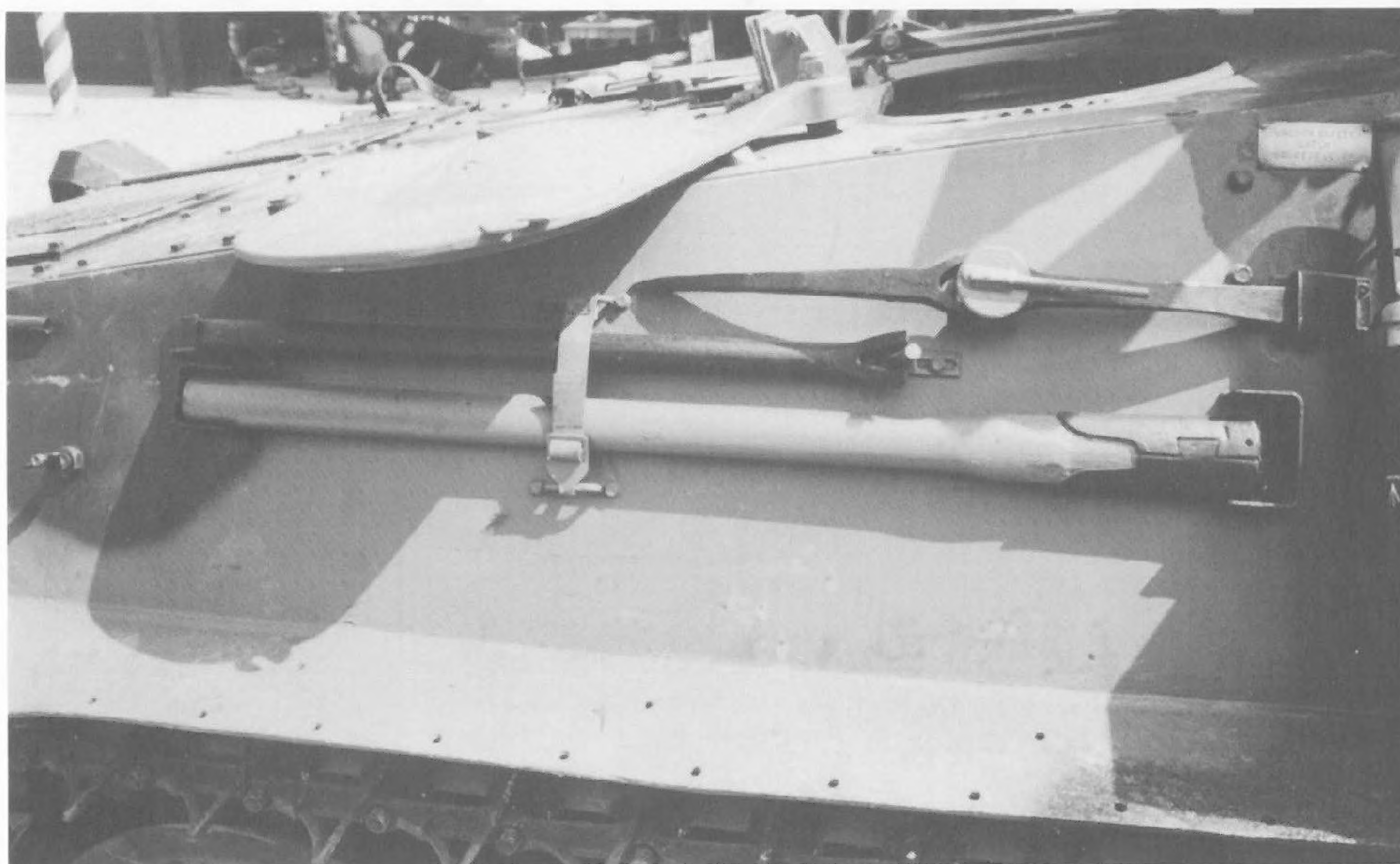
ABOVE: Here is a closer view of the shape of the headlamp shrouds.

BELOW: Here is a closer view of the bolted hatches, with the mesh covers which keeps leaves and other debris from clogging them.





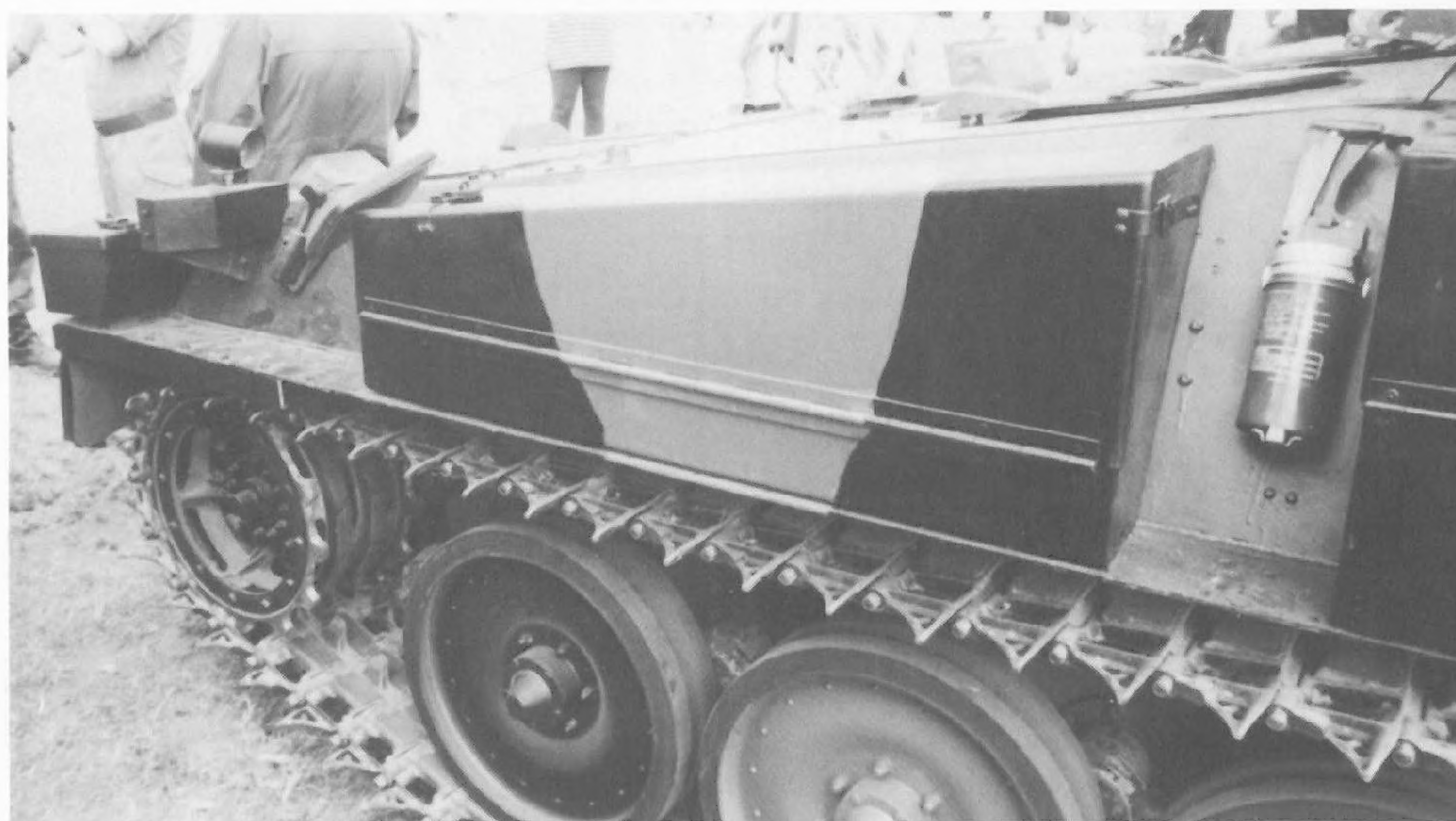
ABOVE: *Scorpion's travel lock differs only in having a curved top instead of flat.*

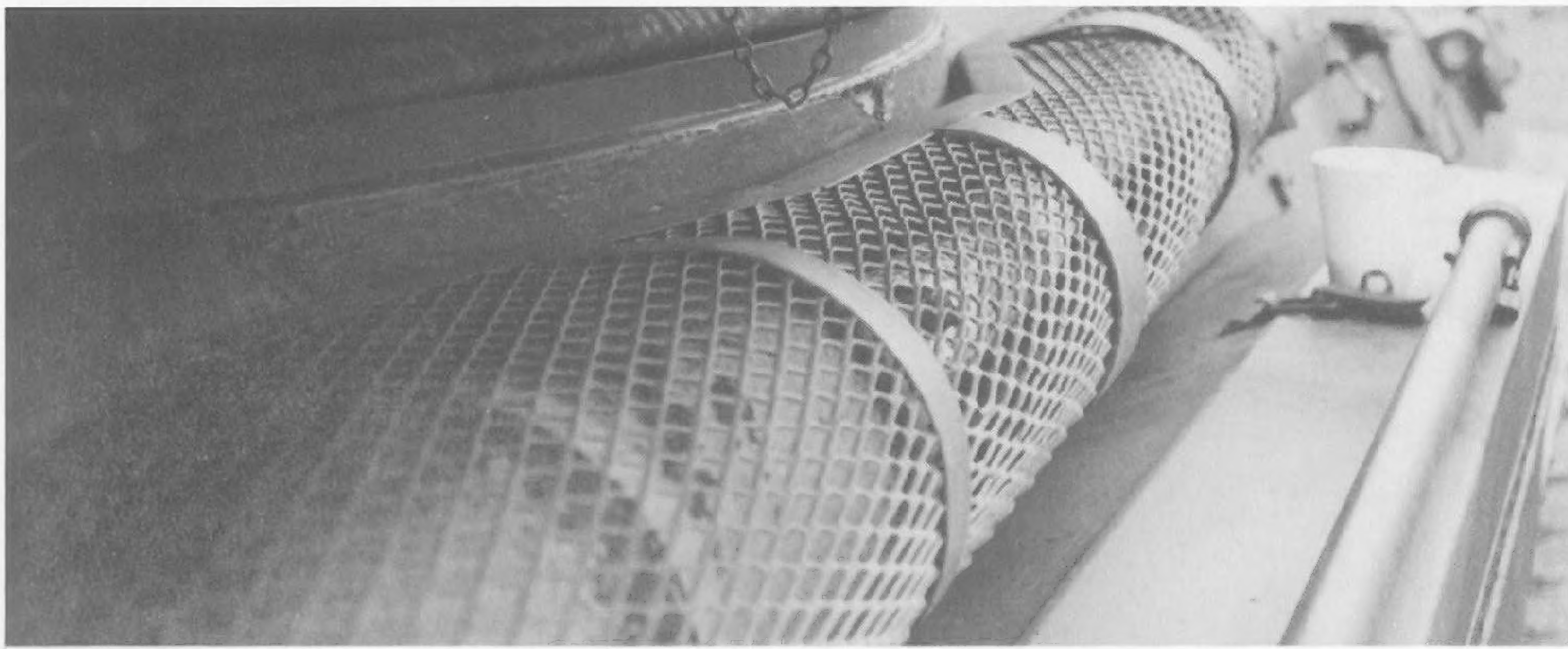


LEFT: *The starboard tool stowage, again with black metal and green painted wood.*

TOP: *The tool stowage on the port side of CVR(T). Note that British AFV tools always have black metalwork and green wooden parts; no bare wood is exposed.*

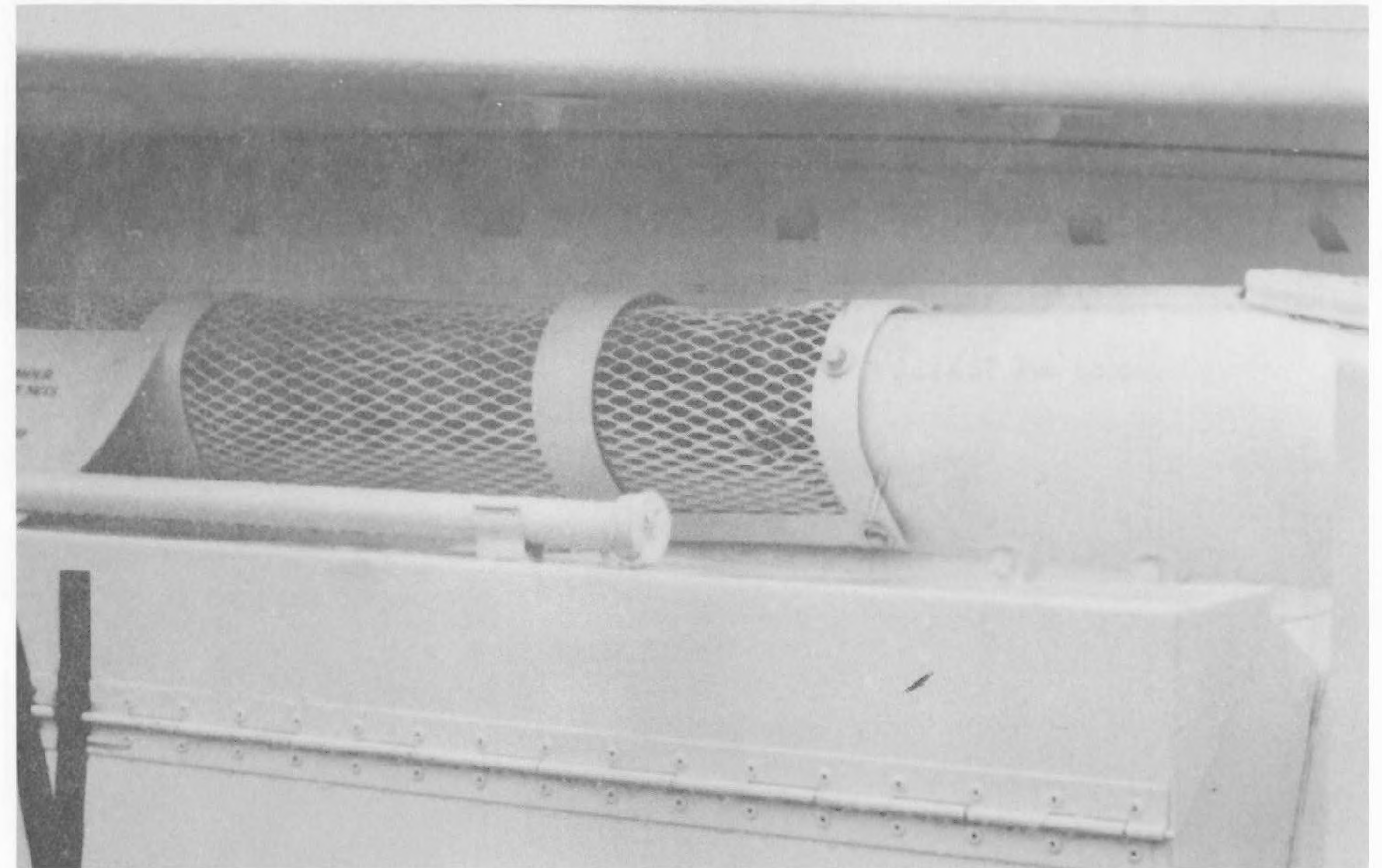
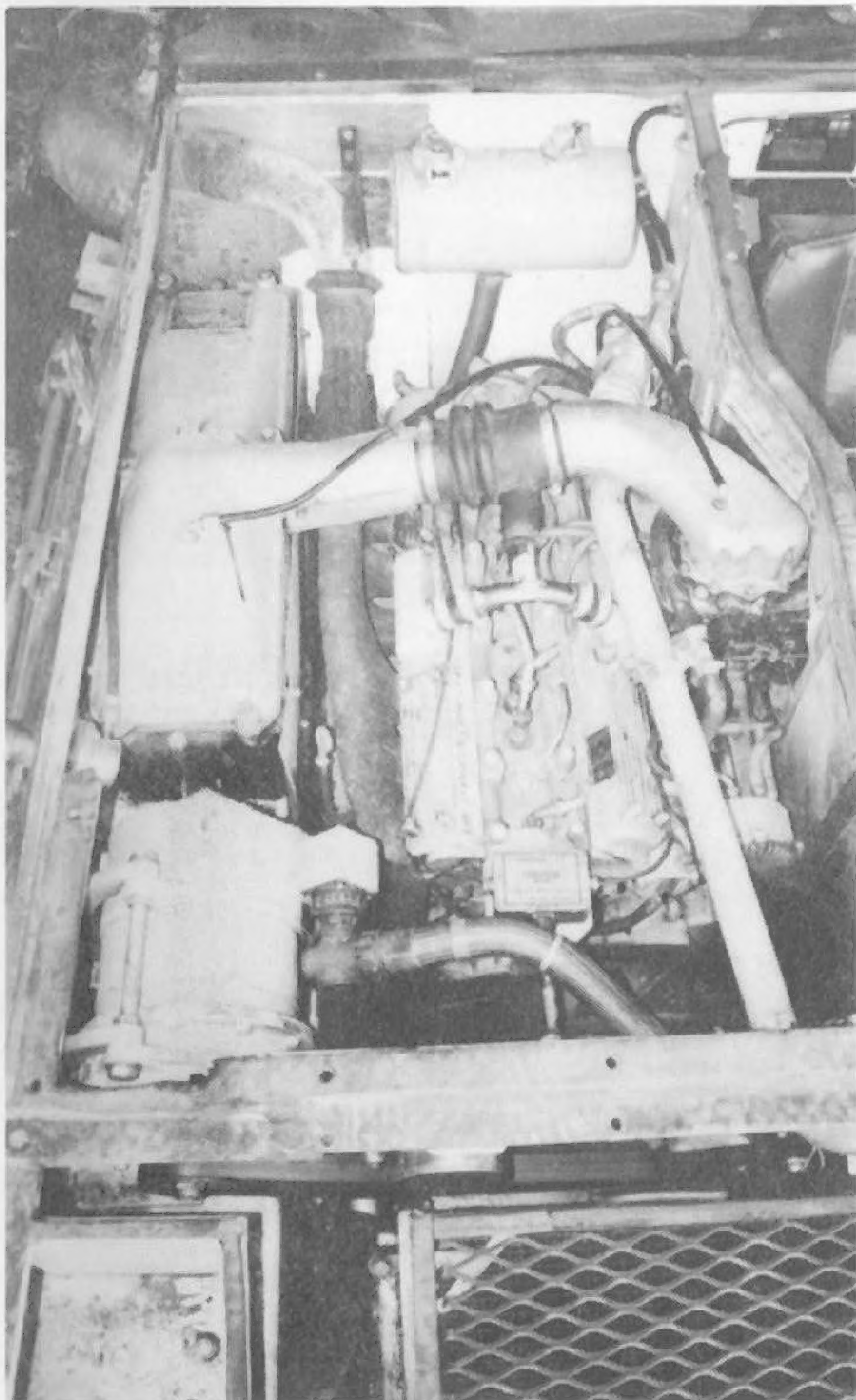
RIGHT: *Sabre's extra side bins are shaped to the profile of the hull so that the driver can see over them.*



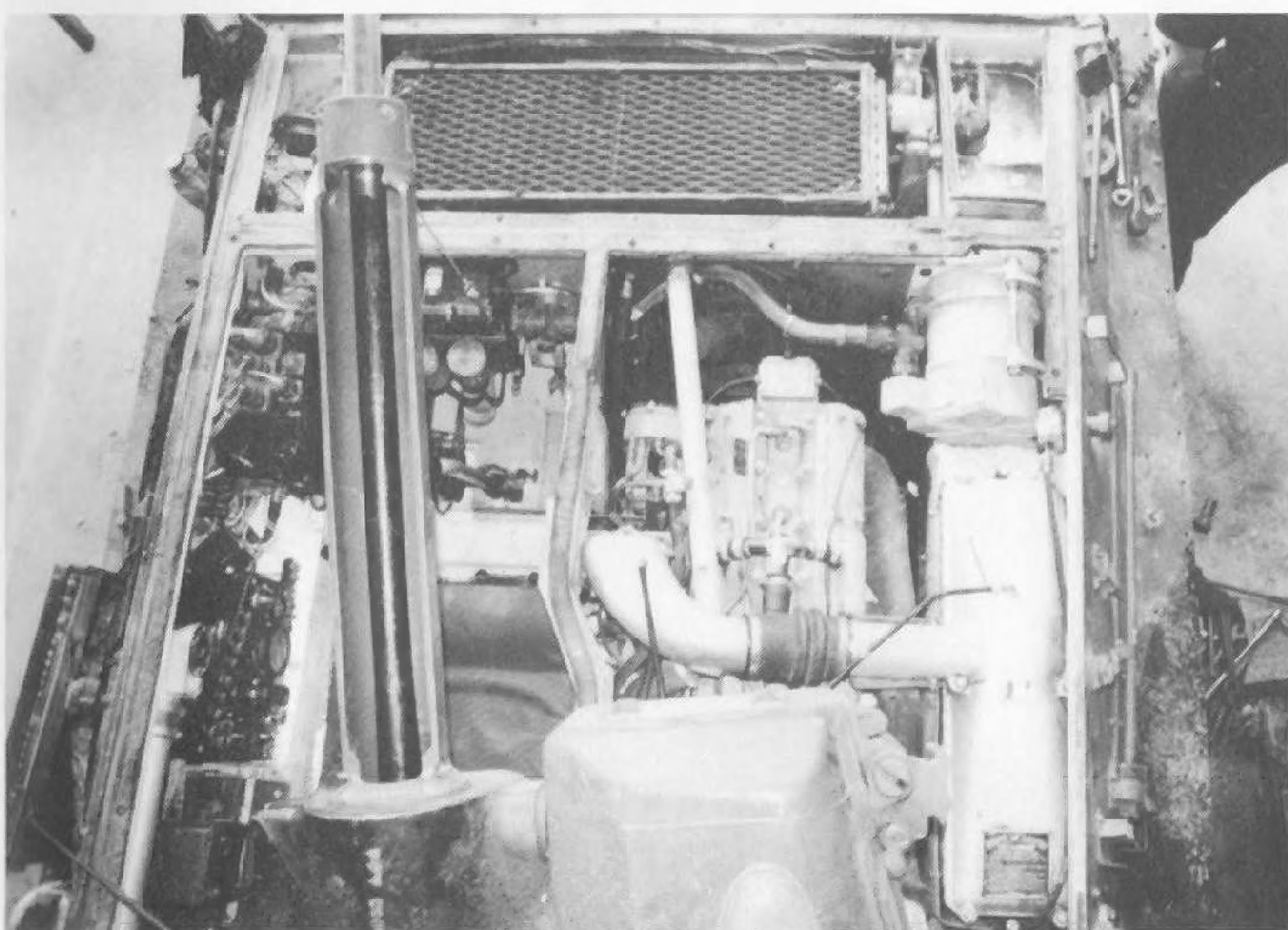


LEFT: Here is a closeup of the exhaust cover mesh, note the reinforcement strips and how it is cut to fit the turret ring.

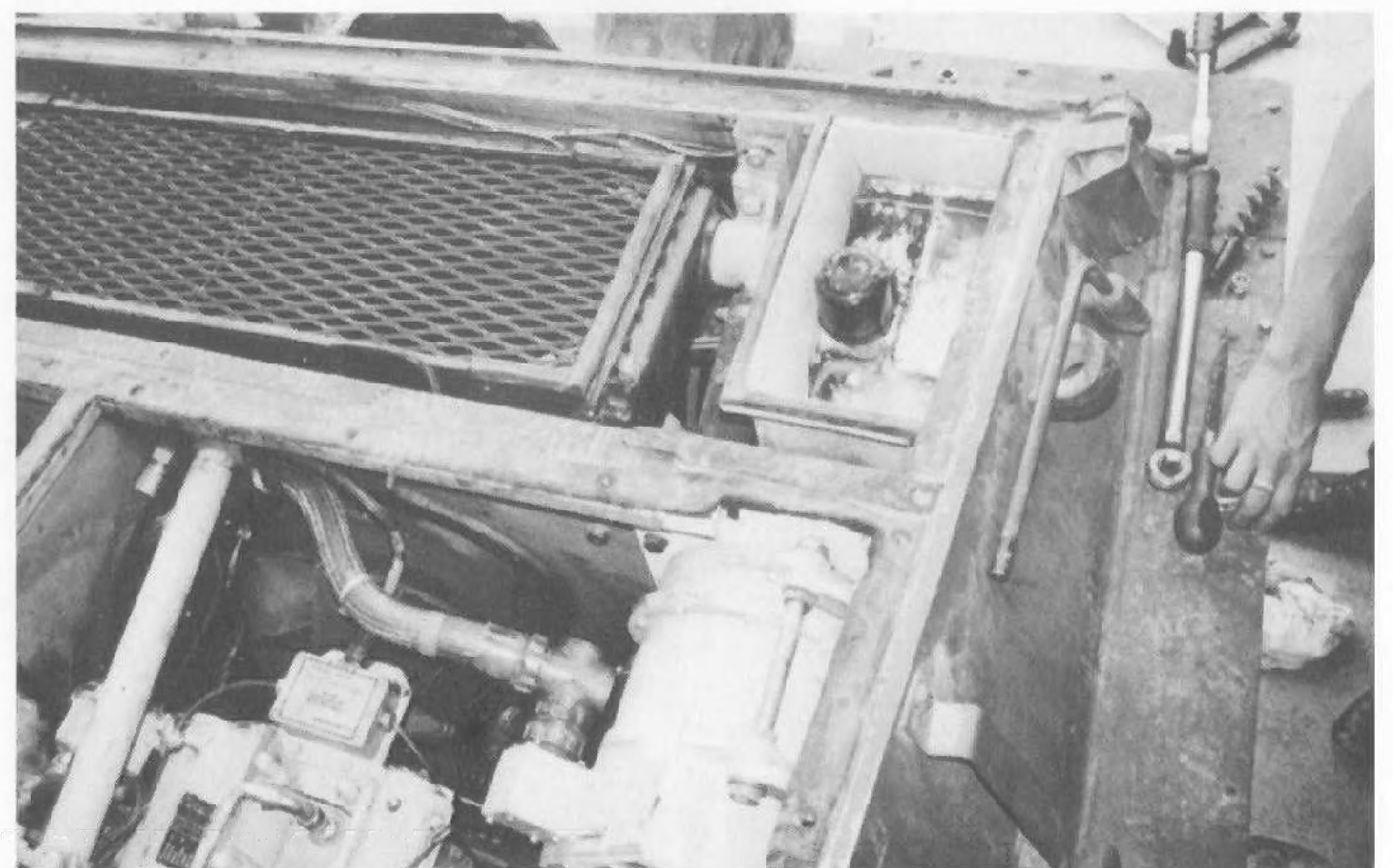
BELOW: Another view of the exhaust mesh. This photograph also shows the second type of adaptor ring. There is no public evidence, but it is probably used on production Sabres, the plainer one being used on prototype conversions. Note, though, that the plain ring has been seen on Sabres deployed to Bosnia.



LEFT: The engine, coolant pipe and generator are light blue and the main cable from the generator is copper. Some ancillaries are light blue, the rest being black, and the air filter assembly is matt silver with a black rubber flexible coupling.

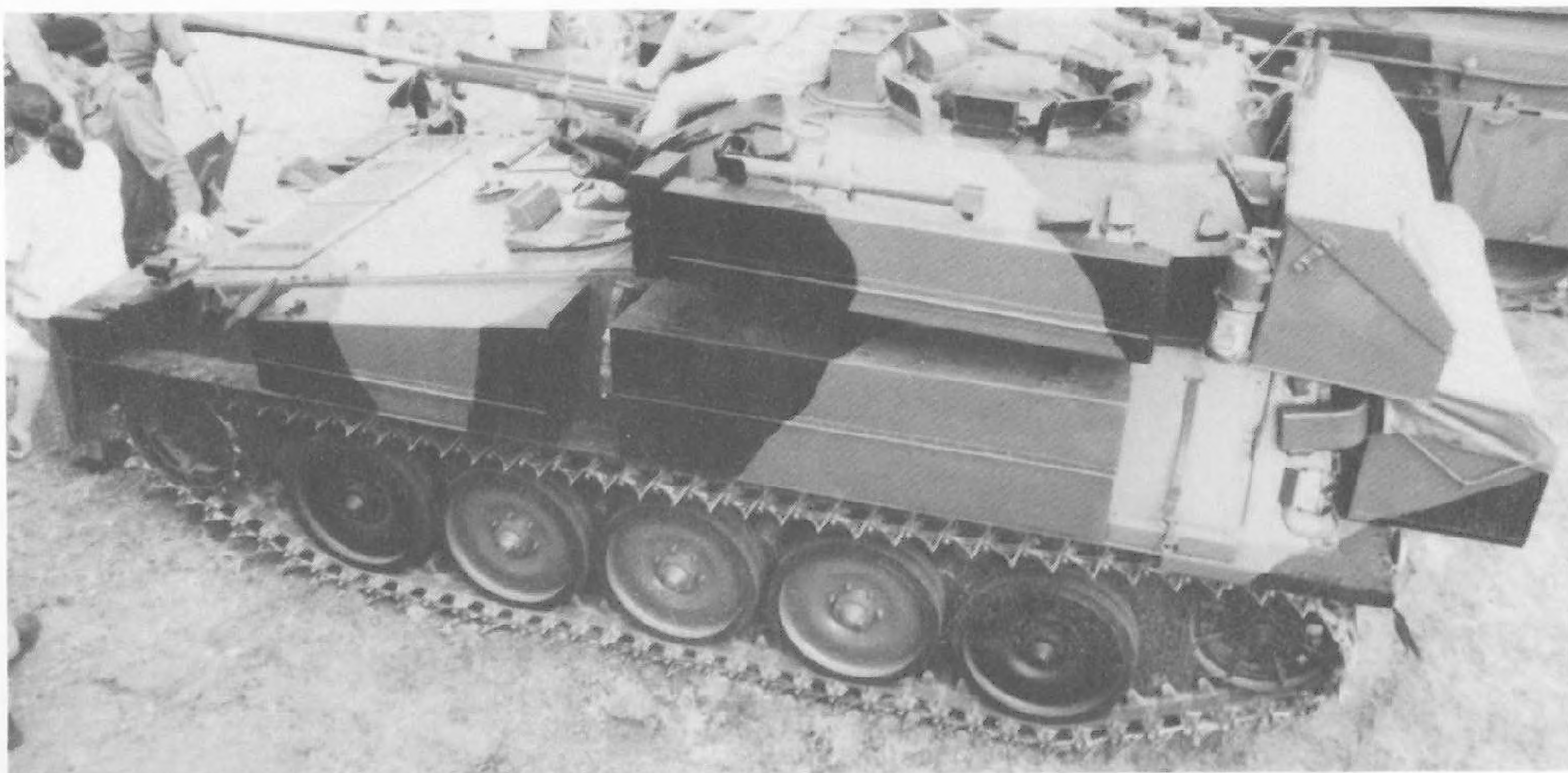


The forward hull interior of Scimitar and Scorpion are identical. Here's an overview; radiator bay in front, engine behind to starboard and driver's station to port.

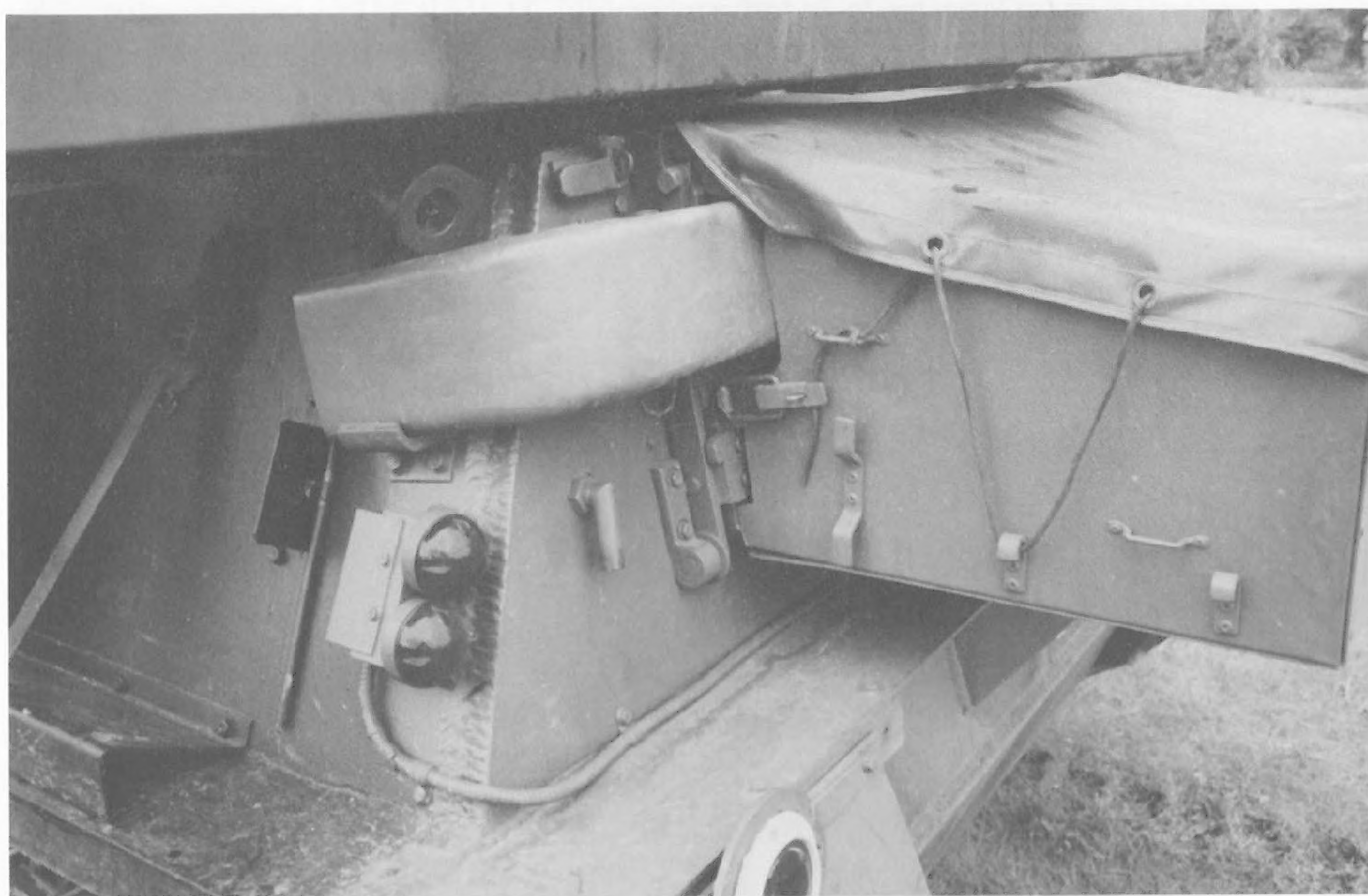


The radiator mesh is orange-red and the fan housing visible in the bulkhead behind it is bronze.

RIGHT: Sabre is a conversion of Scorpion to take the turret of the Fox armored car. This top view shows the quite different shape of the new turret. Note also the new stowage bins on the hull platform and the way the turret rear bin is attached.



BELOW: The hull-rear stowage bin is mounted on the access hatch for the NBC filters. Note its securing latches and cover tie-down points, the electric cable to the taillamps, and the curve of the NBC filter air intake.



A closeup of the NBC intake. Note the shape of the open end.



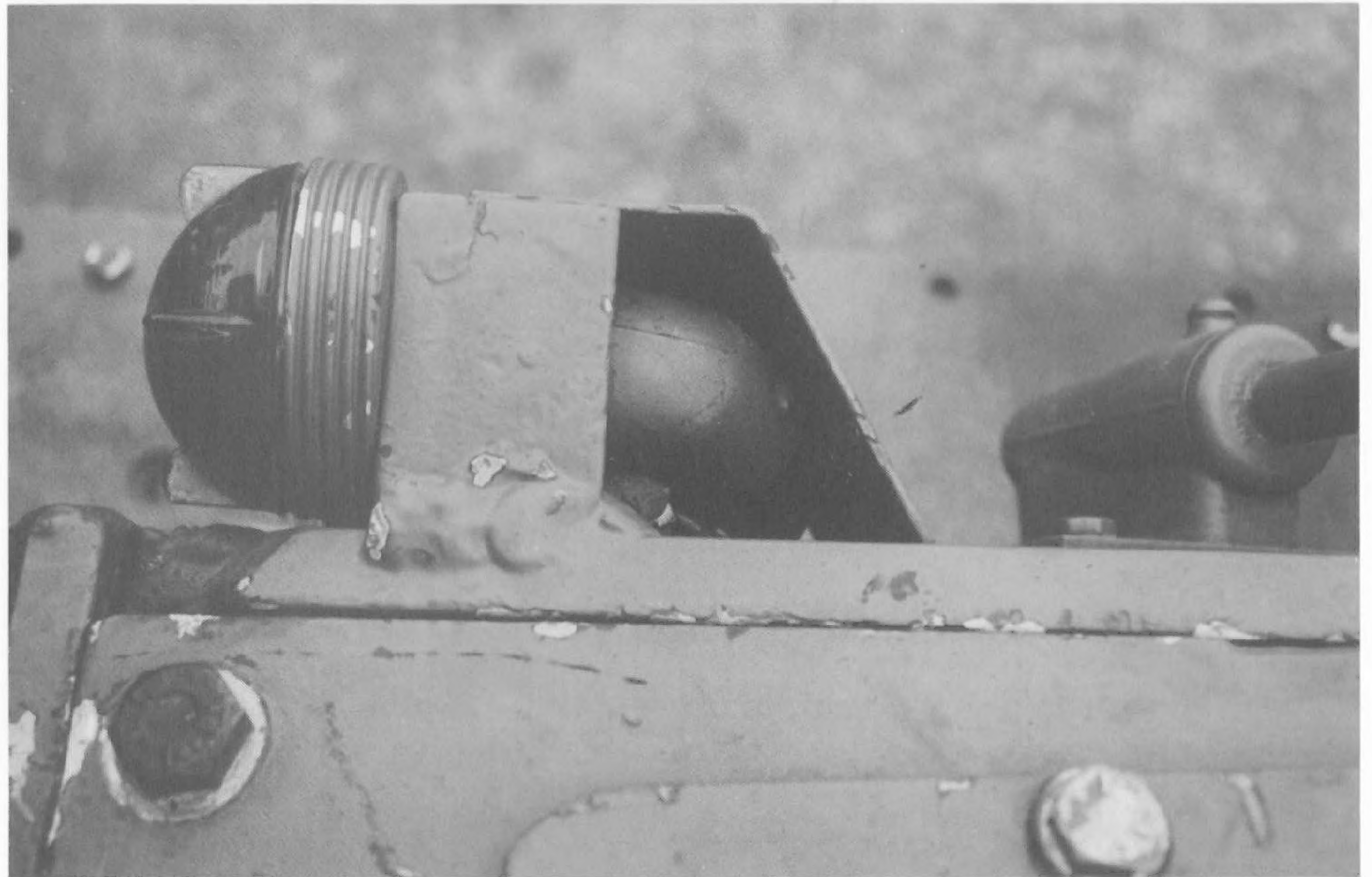
A closeup of the extra can mount.



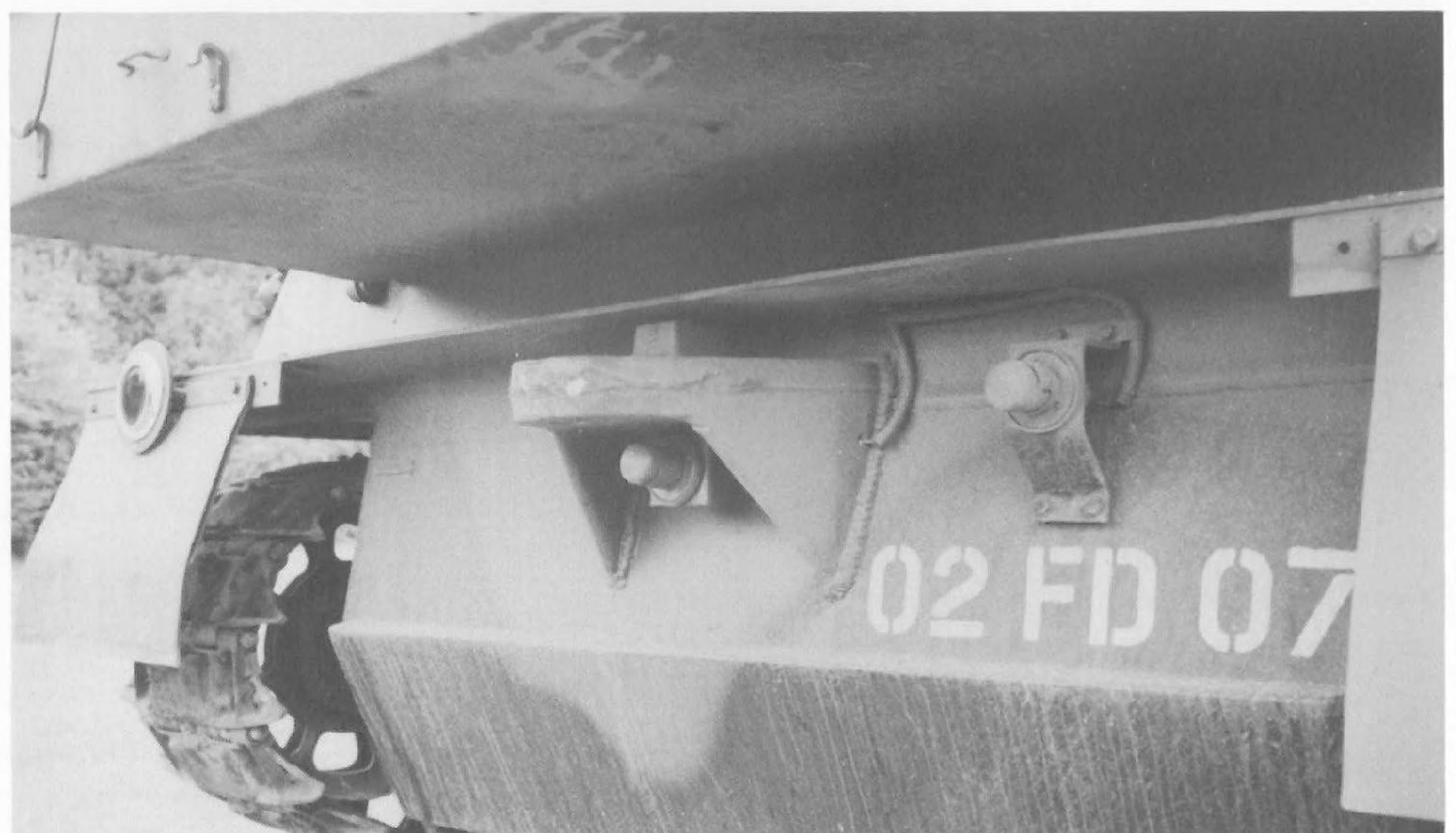
TOP LEFT: Here is the other end of the bin. The top taillamp is red but the amber lower one looks darker when unlit. TOP RIGHT: A large fire extinguisher is carried behind the port tool brackets. The body is green with white lettering, its cap white and its top handle black. Behind is a small brass plate with its operating instructions visible. The rear joint of the glasis plate can also be seen, showing that the hull roof is welded to the top of the sides rather than recessed into them.

RIGHT: The sidelight and taillamp mounts look like this from above.

BELOW: The late towing pintle and strongback have been refitted to this Scimitar, which retains the original registration plate lamp and also has a new one under the pintle though the registration number has not yet been repainted.



RIGHT: Here is the early rear towing point. Note the lamp beside it, to illuminate the rear registration plate, and the layout of the electric cable to the lamp.





ABOVE: Here is the Rarden cradle with barrel removed. The securing pin for the hinged section is retained by a pin, seen here hanging by its cord.

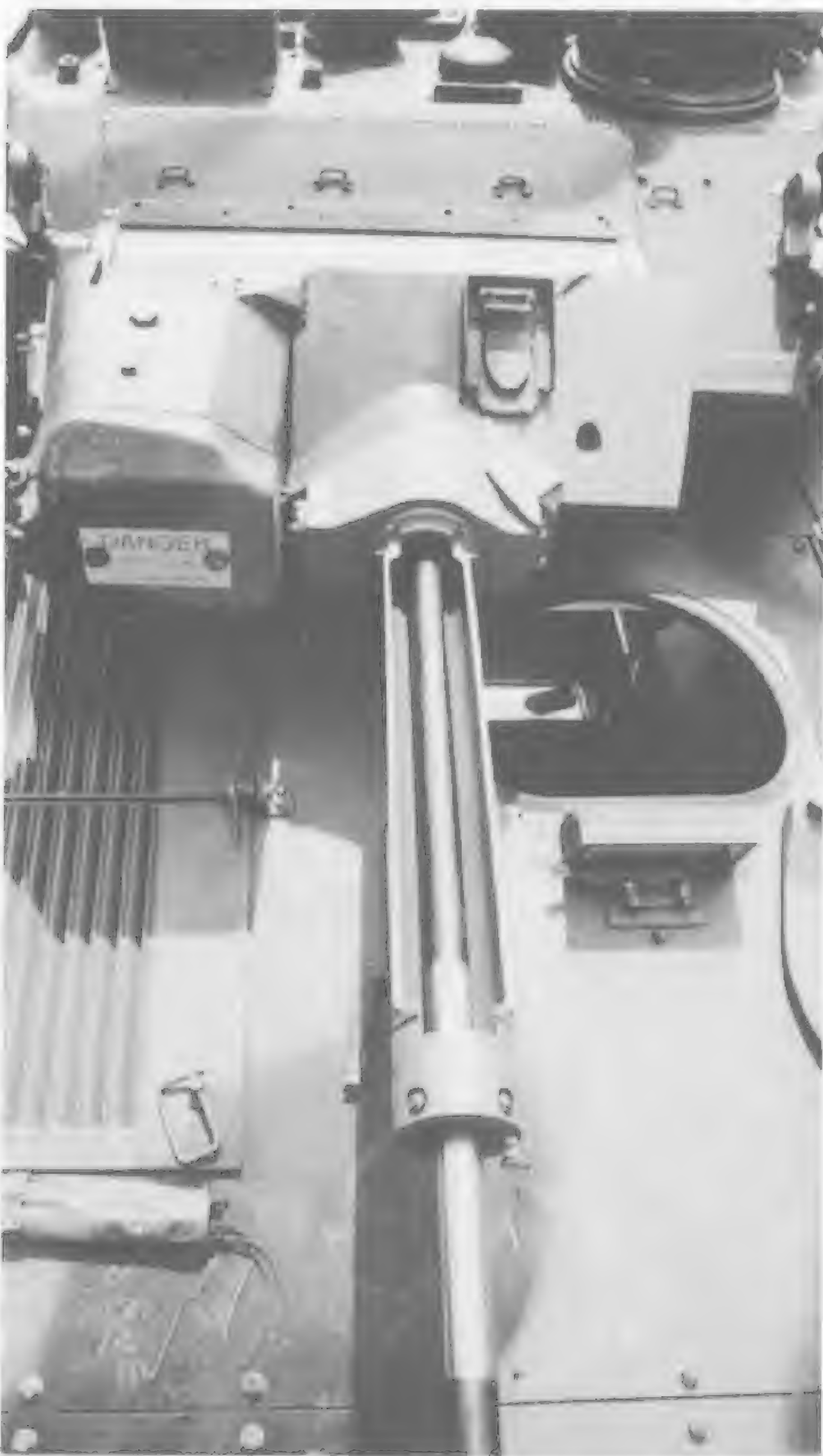


TOP RIGHT: This Sabre has a flash suppressor on its co-axial chain gun.

BELOW: This is Scimitar's gun mantlet. The small opening is for the co-axial machine gun and the flap above it is the ejection port for used Rarden shell cases. Note the bare metal portion of the otherwise black gun barrel and the black and yellow warning sign on the image intensifying sight's power-operated door.



The night sight housing on the Scorpion.



RIGHT: Scimitar's night sight housing. The night sight housings on both vehicles look similar at a distance but are actually quite different close up.





The top of the mantlet and night sight housing of the Scorpion.



Starboard side three-cup smoke mortar.

BELOW: The late four-cup smoke mortar is carried on a bracket fixed to the upper front turret face. In this mount the firing cables exit from the covered outboard face of the lift hook and the auxiliary outlet is on the front of the mortar bracket, again only on the port side.



LEFT: Port side three-cup smoke mortar. This is the early three-cup smoke mortar. The shapes of its mount and bracket are clearly shown, as is their attachment to the lower front turret face. Note the run of the firing cables which exit from the turret lift hook, and that the auxiliary electric outlet in front of the lift hook is only fitted on the port side of the turret.



Another look at the early three-cup smoke mortar.



A view of the port side four-cup smoke mortar.



Scorpion gunner's forward periscope.



ABOVE: A high view of Scimitar shows the shape of the gunner's forward periscope, which differs from that on Scorpion.

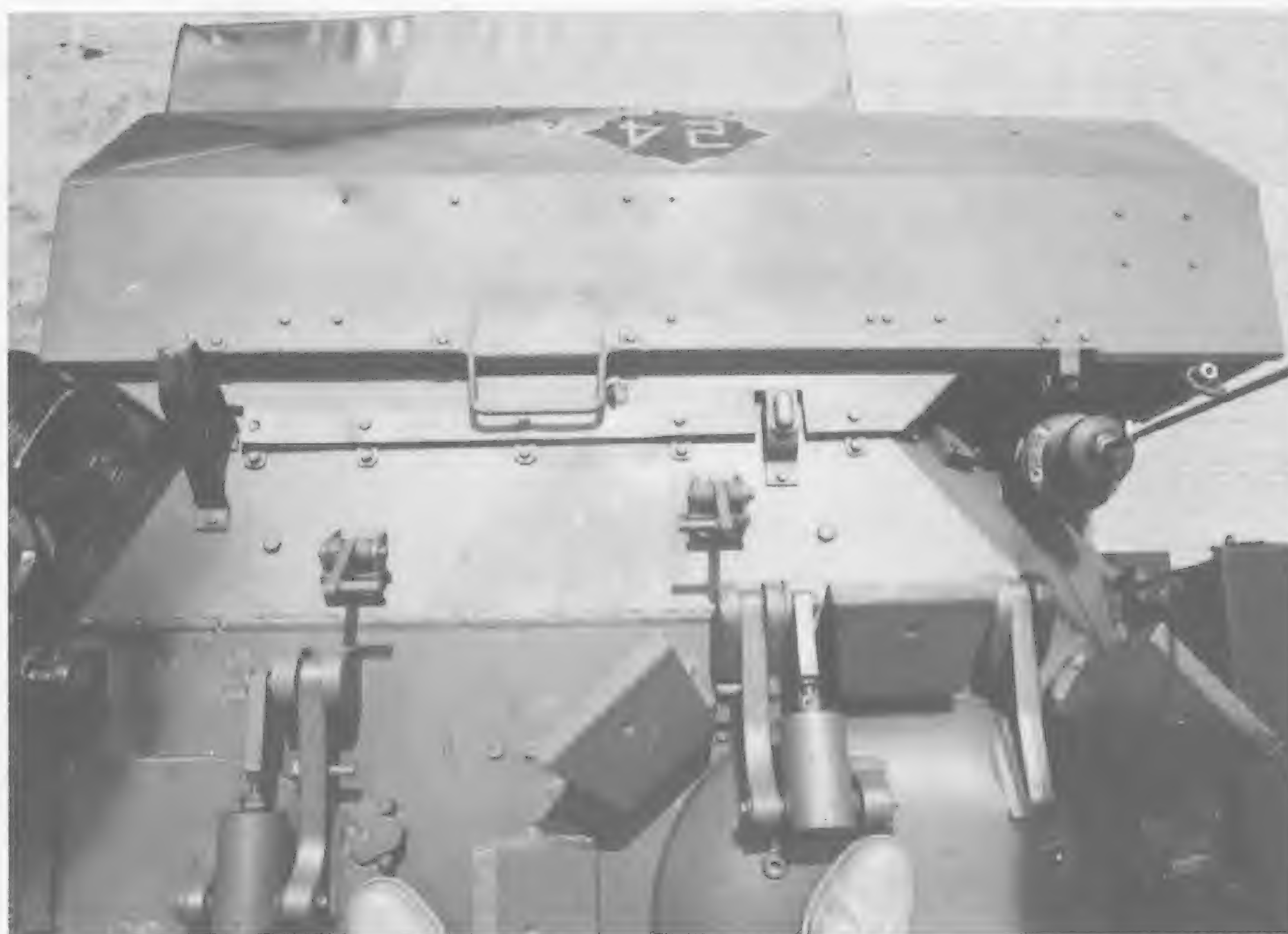
BELOW: The commander's rotating forward periscope is the same on Scimitar and Scorpion. The ring on its housing is the mount for the commander's spotting scope. The scope is stored in the turret rear bin and is only mounted when observing in a stationary position or moving very slowly. Note the periscope wiper blade.



BELOW: The open turret hatches show off their interior detail. Both have medium green headpads and khaki green grabstraps.



Here is the closed commander's hatch. Note the damper piston, the hold-open catch, and the low bumpstop mount behind it.



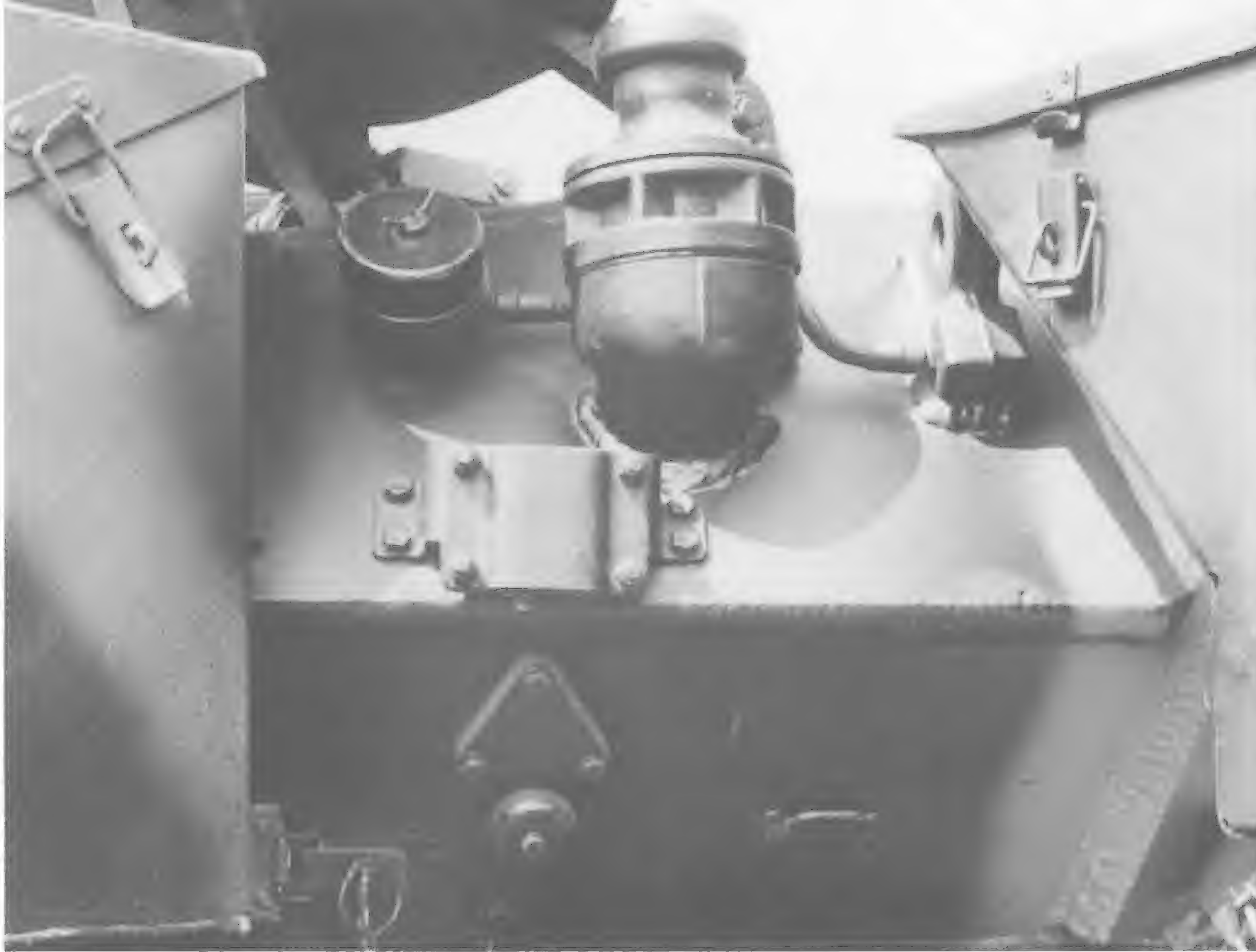
This top view of the turret rear bin shows how it is mounted by a flange bolted onto the turret roof.

BELOW: This rear view of a Sabre turret side bin shows how it is shaped to the turret.



The shape of the turret rear is revealed when the bin is removed.





ABOVE: The starboard rear quarter of the turret has an antenna mount and cable outlet connector. Below them is the bracket for carriage of a cable reel.

RIGHT: Here is the cable reel fitted into its bracket. This is the standard mounting position but some vehicles have extra stowage bins fitted which prevent its use so their reels are moved to the side or end of a bin.

BELOW: This top view of the reel shows how it clips into the bracket.



ABOVE: The port rear quarter of the turret carries only an antenna mount. The lower fixing of the rear turret bin can be seen here.

BELOW: The new larger fire extinguisher is sometimes moved to the front of the turret-side bin.





The driver's seat is dark green; this one has a replacement khaki-green cushion.



A closeup of the instrument panel. It is black, but the fittings to its rear are exterior green.



The instrument panel and "black boxes" are to the left of the driver.

A closeup of the steering levers and control pedals.





A view down through the commander's hatch of Scimitar. In his seat is a toilet. Ready round clips are stowed in the central console, in front of which is an open stowage tray.



TOP RIGHT: Here is a closeup of the commander's rotating periscope. Note the traverse indicator above it and the optic cover hanging by a chain.



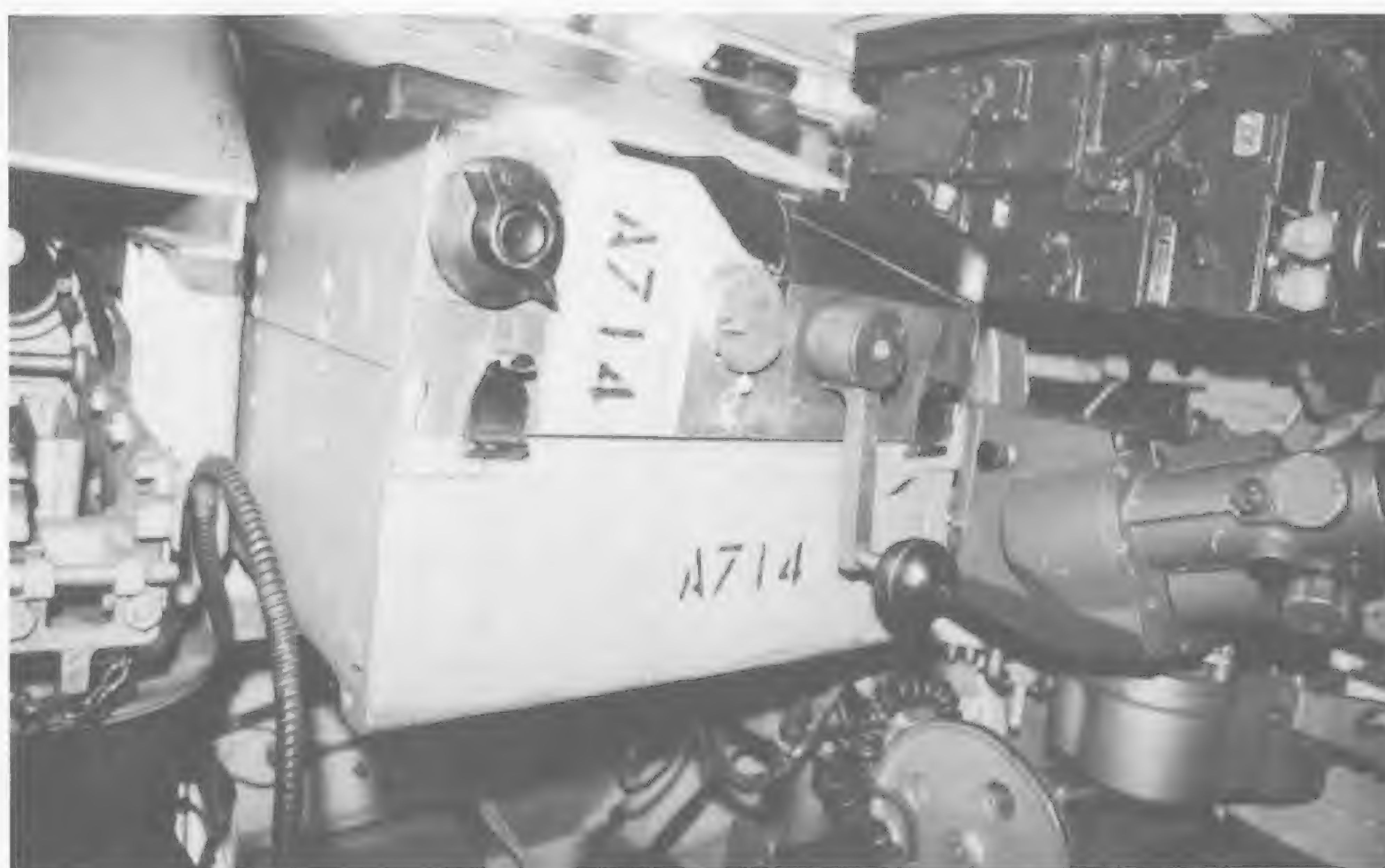
The commander's periscope and the turret wall beside him.



Behind the commander are the radio rack, empty here, and various green junction boxes.



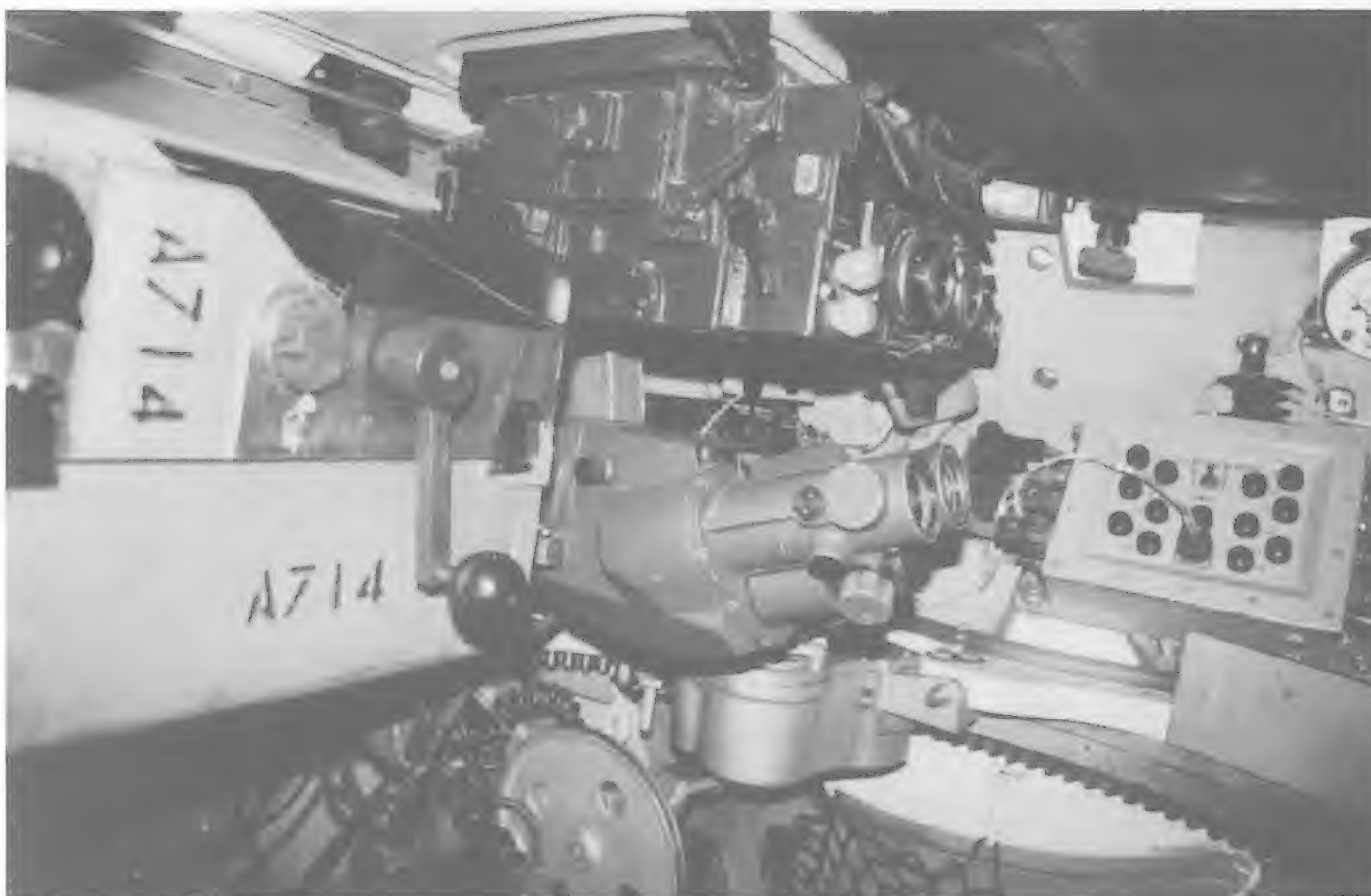
The co-axial machine gun is mounted in front of the commander, with a spent case chute under it.



RIGHT and TOPRIGHT: The RARDEN breech cover from either side.



The Scimitar gunner's periscope seen through his hatch, with the optics of the image intensifier below it.



The gunner's periscope and image intensifier seen from the side. Below them, the elevation handwheel can be seen with the traverse gearbox beside it.



The gunner's seat. His sponson is also covered by a cargo net in both Scimitar and Scorpion.



Beside the gunner is a light blue electrical services box and green junction boxes.

A battery charger is mounted on the turret ring between the commander and gunner. The hull rear behind them contains another ammo clip rack, just visible through the cargo net, and more clips are stowed on the hull floor behind the seats.





Compare this shot of the turret wall beside Scorpion's commander with the corresponding view of Scimitar.

Scorpion's 76mm gun breech and its guard.



The commander's periscope in Scorpion is the same as in Scimitar, but note the pressure gauge and fire extinguisher fitted to Scorpion.

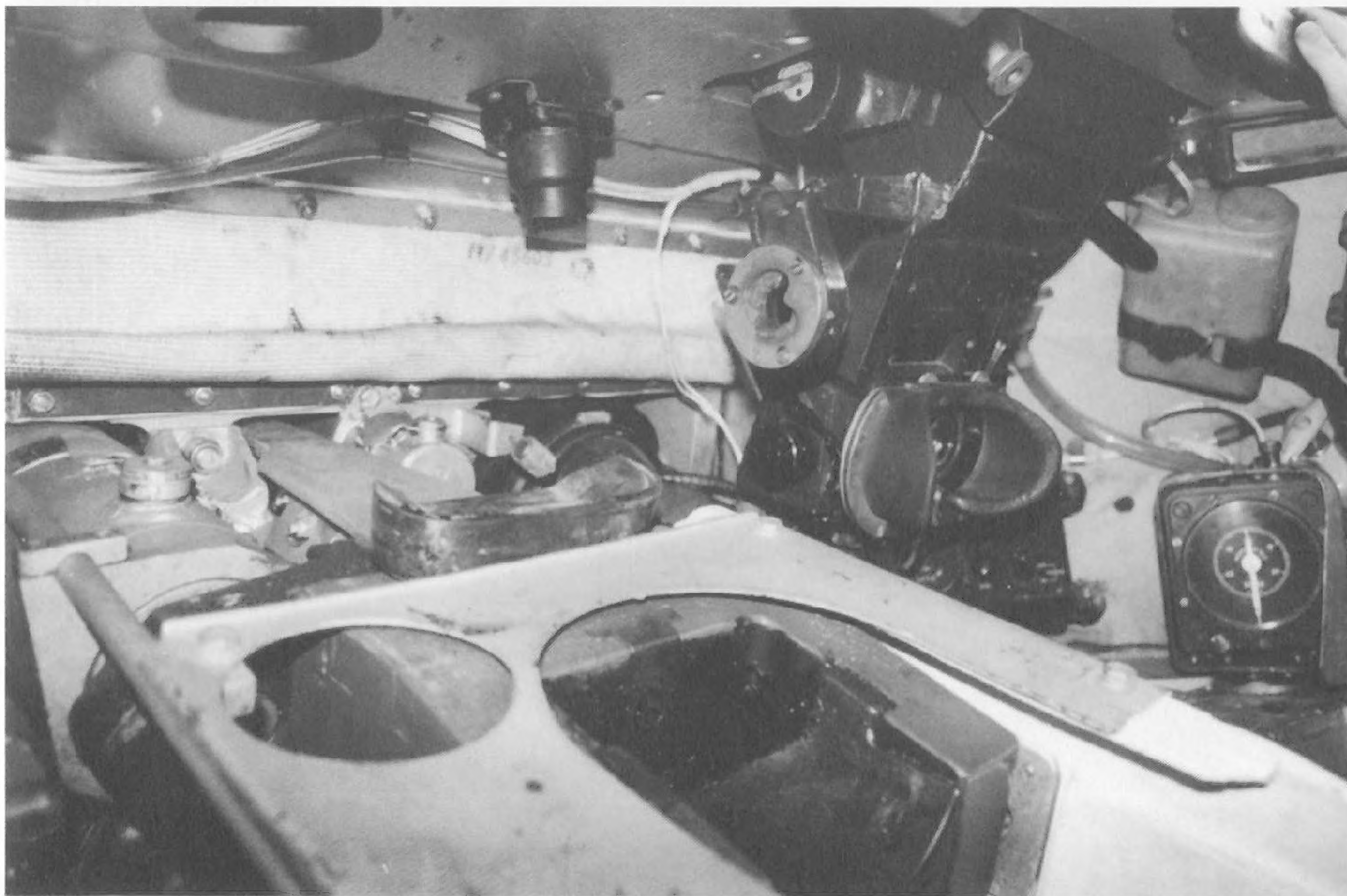
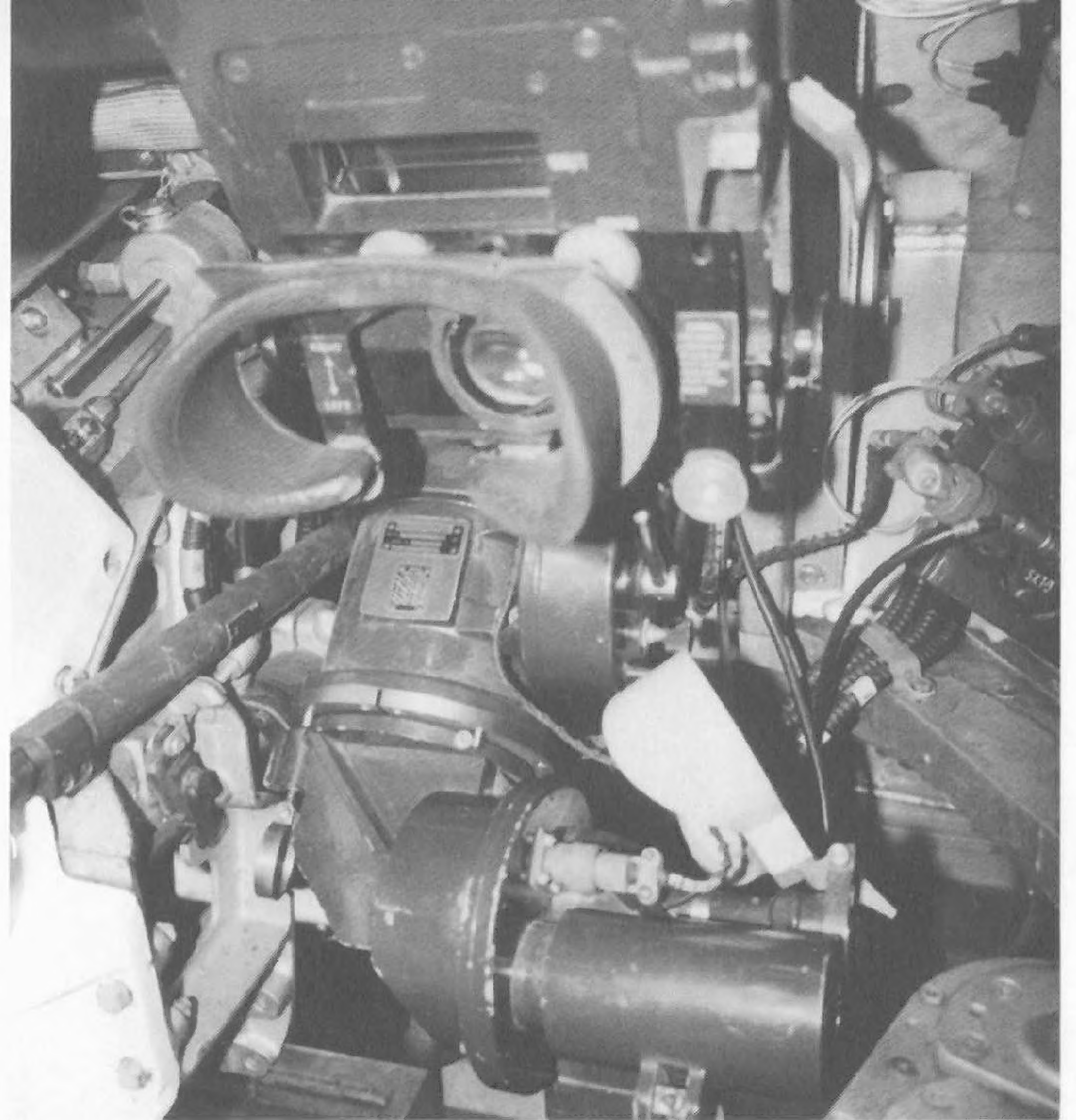


Both Scimitar and Scorpion have a stowage box, painted black, on the hull floor in front of the commander. The lower end of Scorpion's coaxial machine gun spent case chute is visible here.



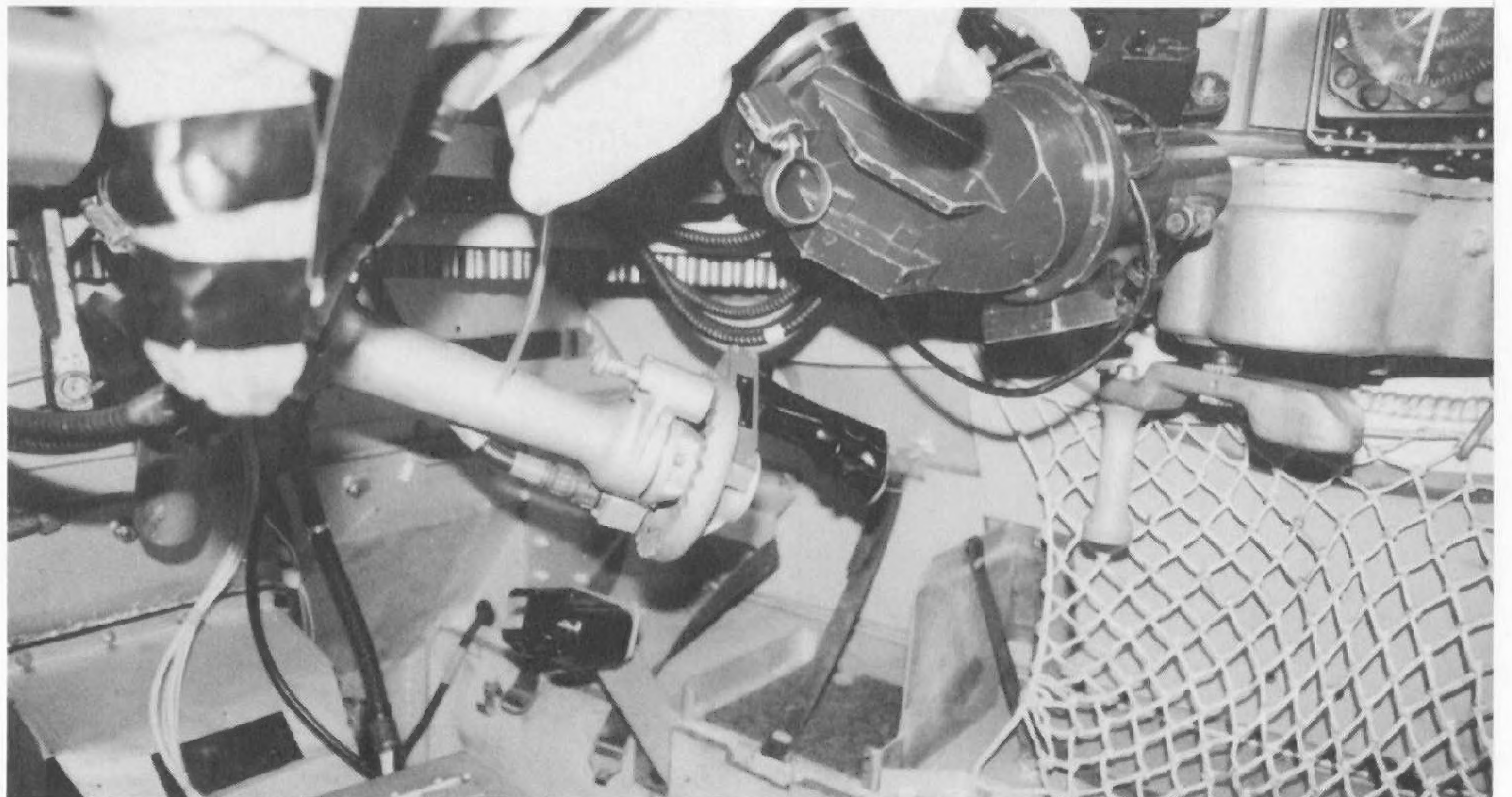
Below the breech guard is a spent case bin, which also serves the co-axial machine gun case chute. In Scimitar the co-axial case chute leads into a closed bin under the stowage tray already seen.

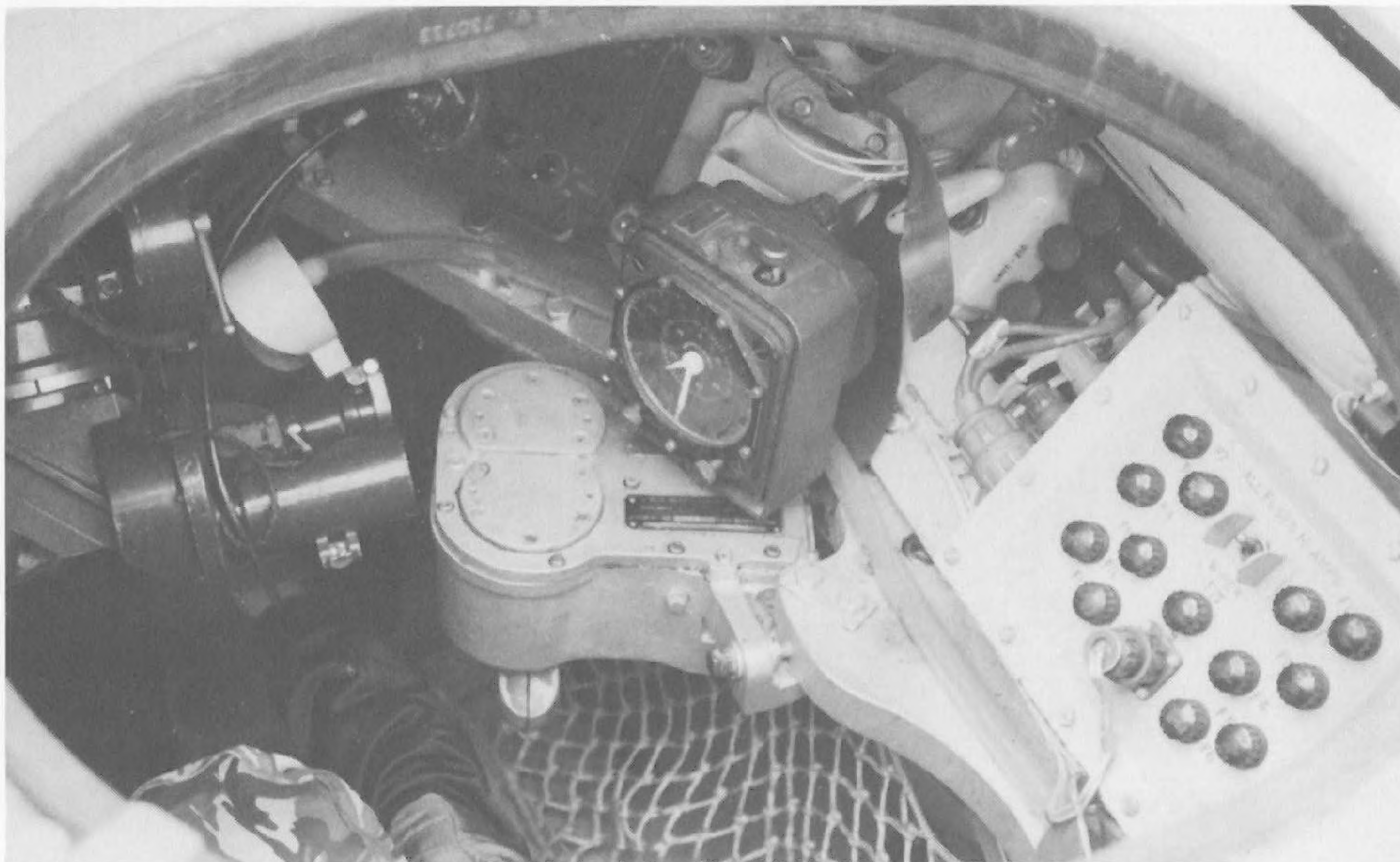
RIGHT: The optic of the Scorpion gunner's image intensifier, seen here under his periscope, is pivoted to the side for protection.



Here is the gunner's periscope of Scorpion. It pivots back for access to the turret, unlike Scimitar's which is quite hard to get past, so does not show when looking down through his hatch.

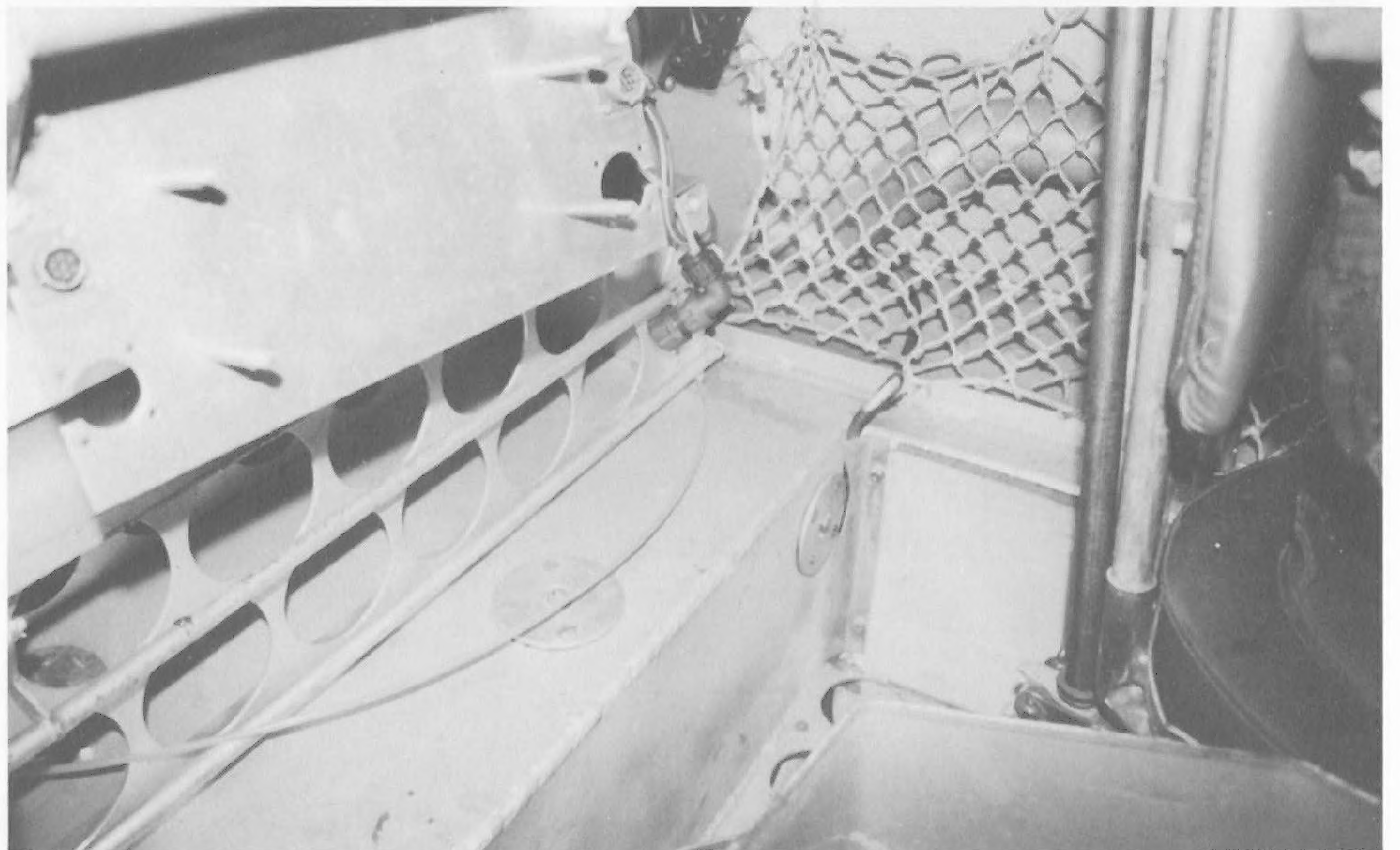
The traverse control of Scorpion, on the right of this photo, is the same as that of Scimitar but the elevation handwheel in the center of the shot is very different.



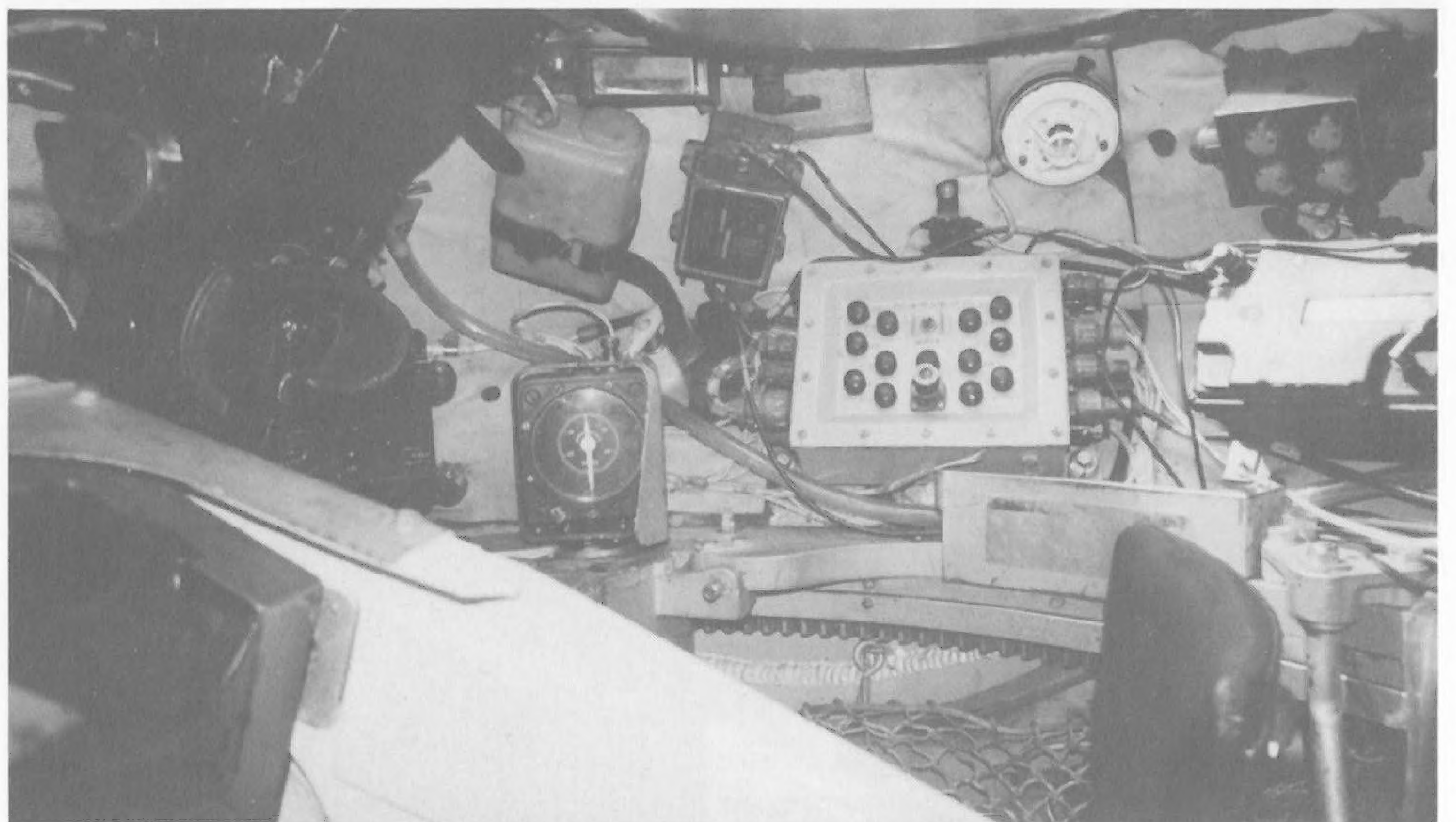


Here is the top of the traverse control. Above it is the traverse indicator fitted to Scorpion.

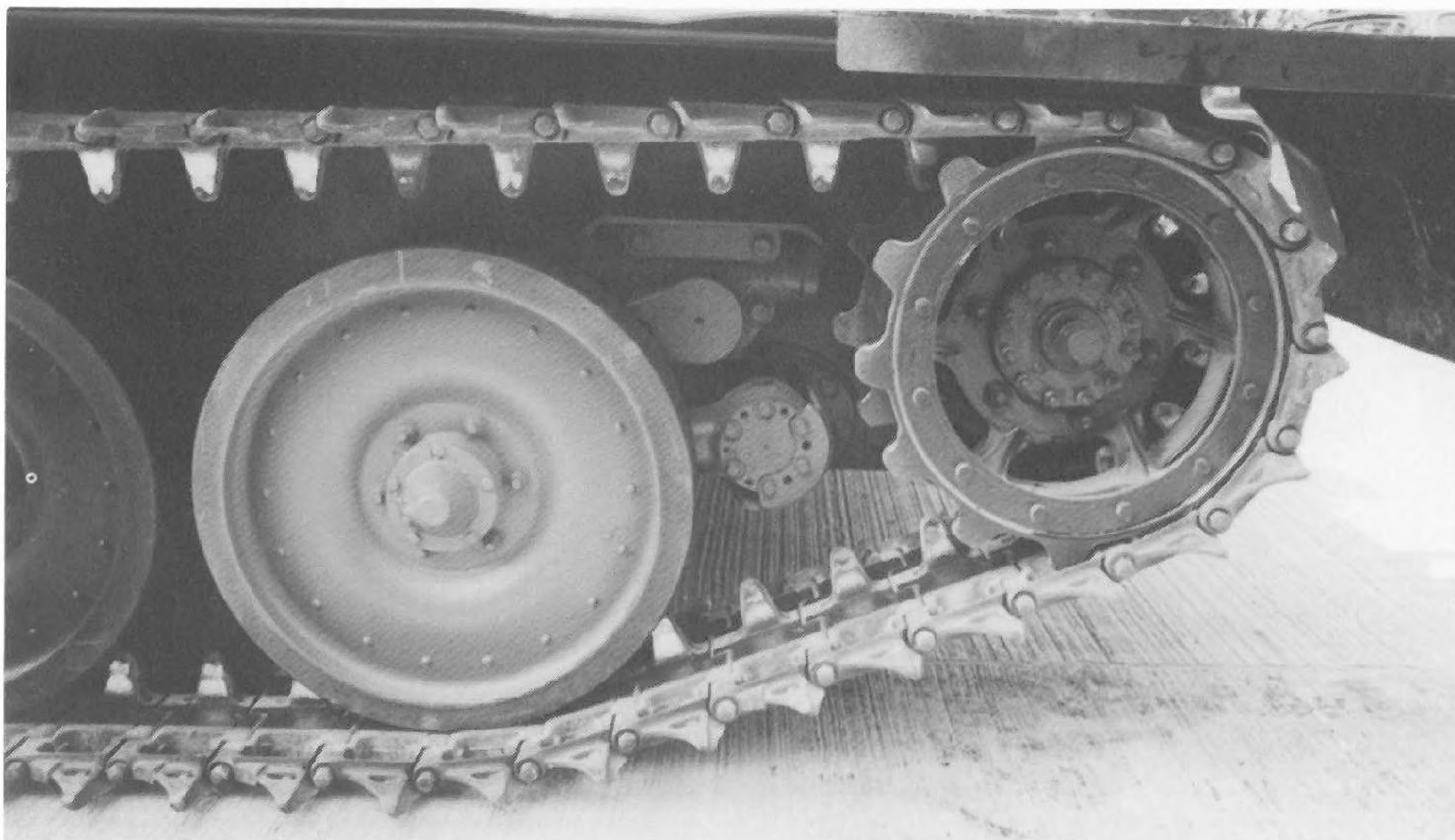
BELOW: The turret rear of Scorpion has the same radio rack as Scimitar, but the hull rear has ammo racks for the larger 76mm rounds and more are stowed on the hull floor behind the seats.



Both Scimitar and Scorpion carry these black stowage boxes on the hull floor in front of the gunner.

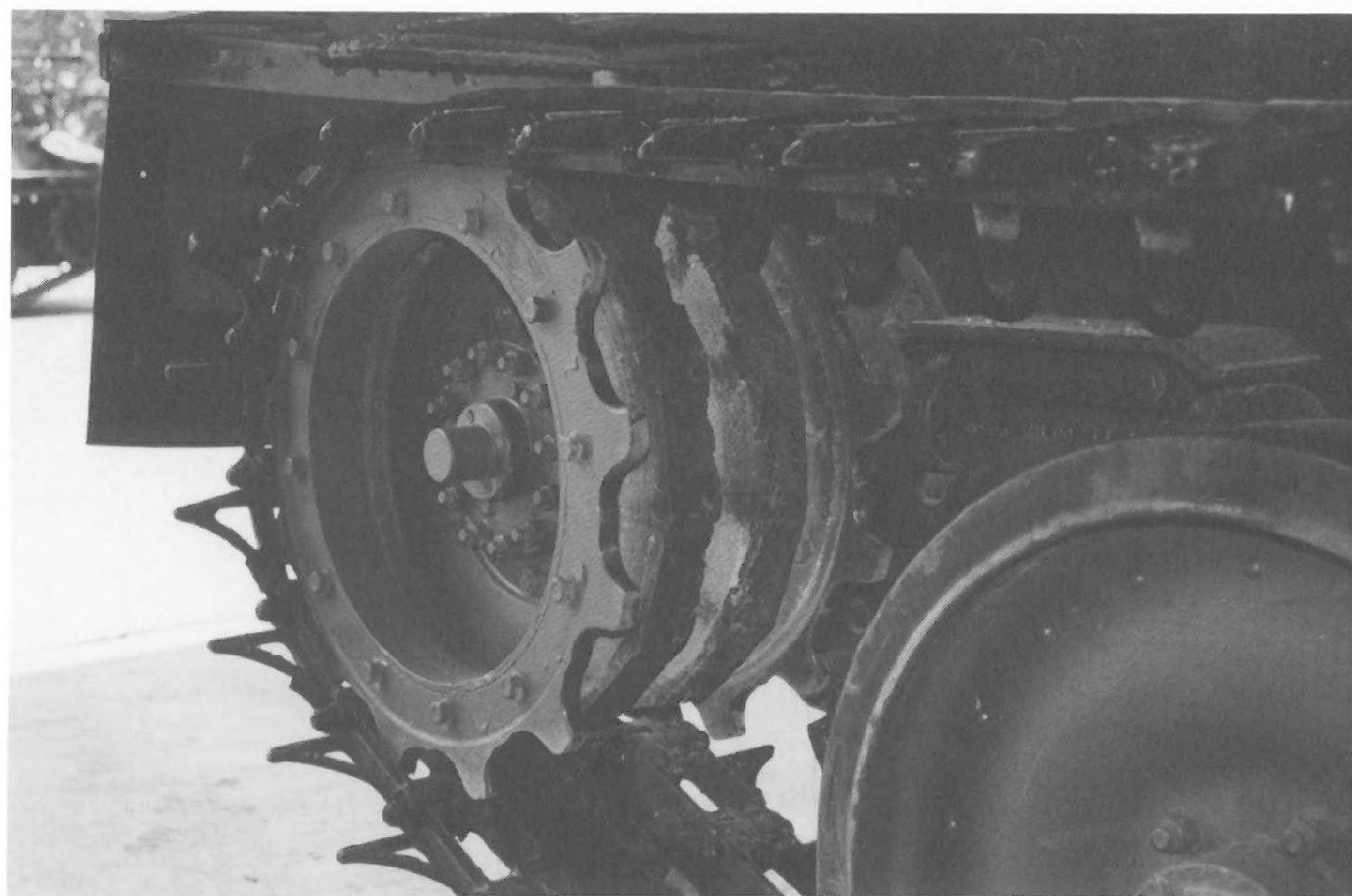


The turret wall beside the gunner in Scorpion.

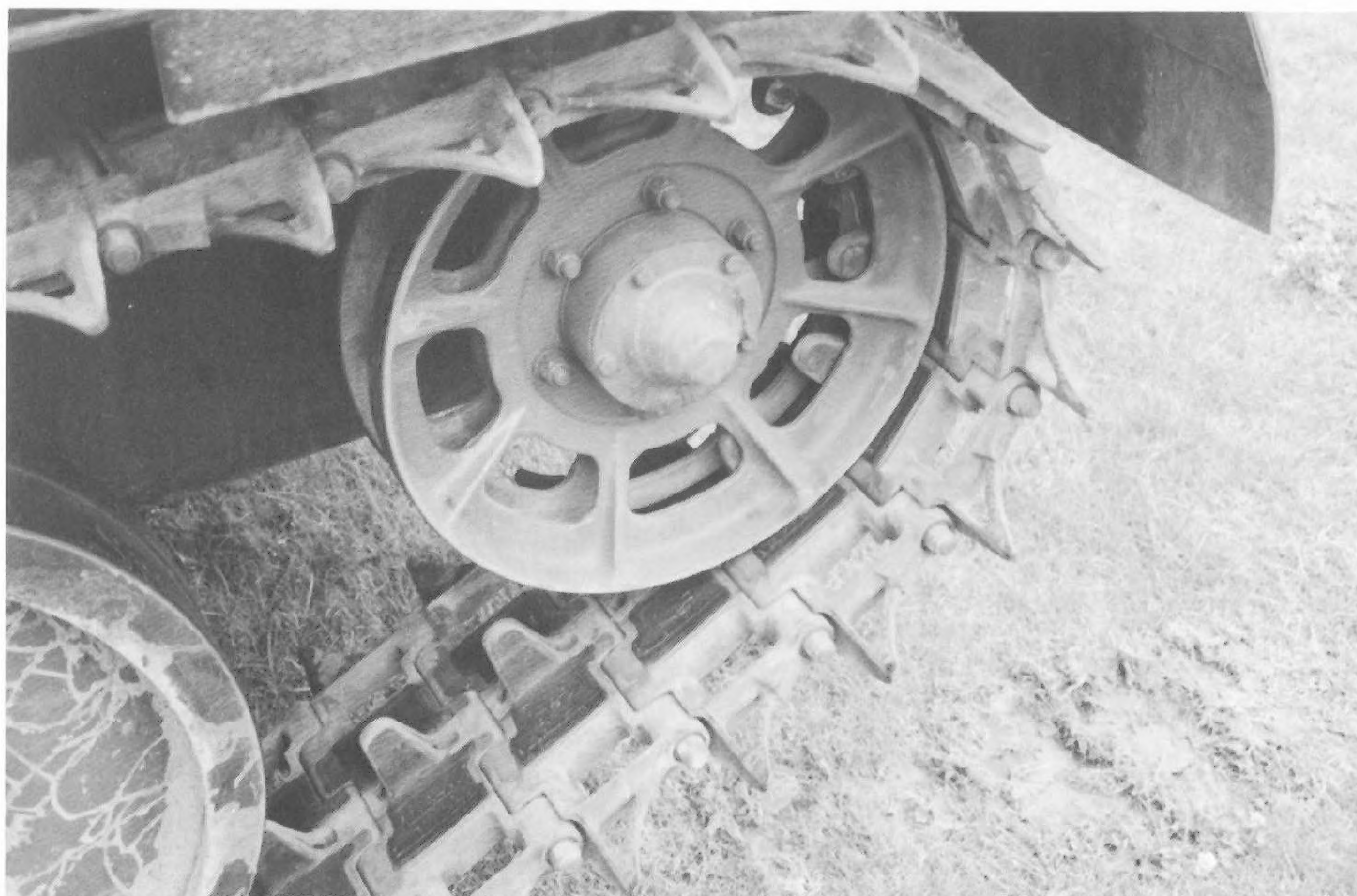


The late sprocket seen from the side, with a good view of the front roadwheel's swinging arm and shock absorber mounts.

BELOW: The early sprocket also had the rubber rings and was a simple dish in appearance although quite complex in construction.



This is the late spoked idler; the plain dished idler has so completely disappeared from use that I have not found one to photograph. The rubber pads on the inside of each track link are also shown here.



The steel track links also have rubber pads on their outer surfaces.

